The world's most comprehensive encyclopedia of the military weapons of the 20th century

WAR MACHINE

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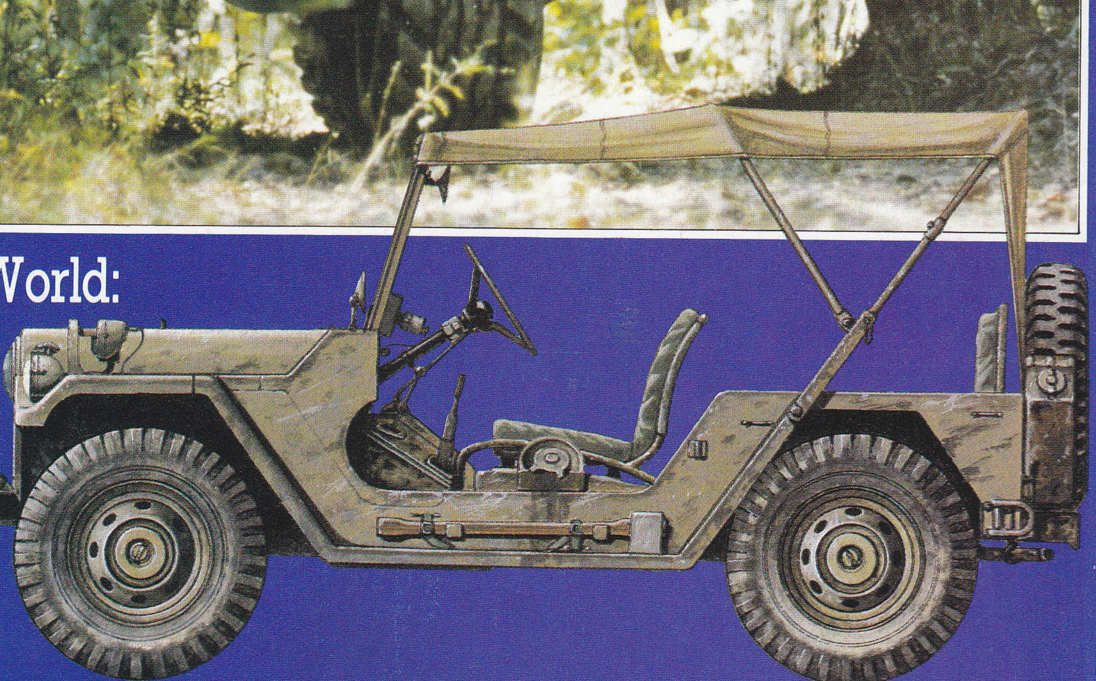

- Armed Forces of the World: US Air Force (Part 3)
- Fast Attack Vehicles
- Operation 'Protea'
- Hummer Competition
- Land Rover in Action

A fully illustrated guide to Modern Light Vehicles

WAR MACHINE

Volume 4 **Issue 47**

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Armed Forces of the World

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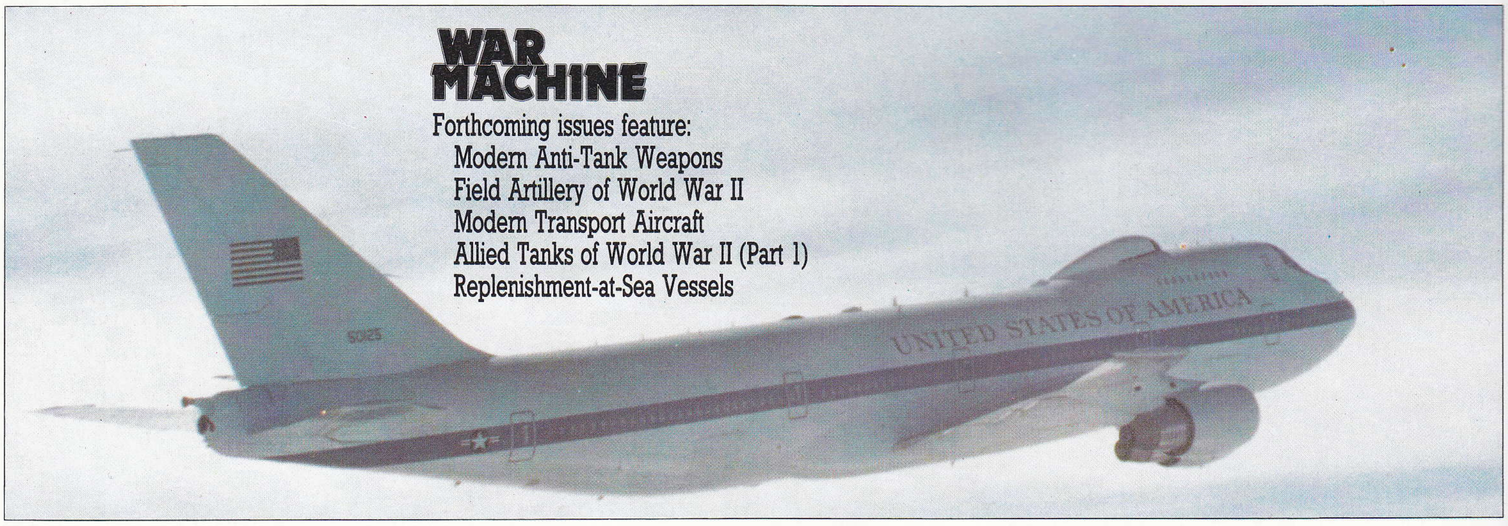

WAR MACHINE

Forthcoming issues feature:
Modern Anti-Tank Weapons
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Modern Transport Aircraft
Allied Tanks of World War II (Part 1)
Replenishment-at-Sea Vessels

Modern Light Vehicles

Light utility vehicles have become an essential item in the inventories of the world's armed forces, ever since the Jeep proved its worth in World War II. They are used for an astonishing variety of purposes both in combat and rear echelon duties, and without them it would be difficult for armies to carry out the most routine of tasks.

The advent of the helicopter has enabled the light vehicle to makes its presence felt in many areas. Here a first-aid Land Rover of 41 Commando awaits a helicopter lift from the carrier HMS Hermes *during a deployment to Cyprus.*

The Jeep developed in the USA during World War II has probably become the most famous wheeled vehicle ever produced, and there are many who firmly believe that this light vehicle was a decisive factor in the eventual outcome of World War II. Since then light vehicles of one type or another have become an essential part of every army in the world. It is interesting to note that the French Hotchkiss M 201 light vehicle, a direct descendant of the Jeep, is still in active service with a number of armies.

Light vehicles are used in every conceivable role ranging from general runabouts for officers and NCOs to command vehicles, forward ambulances, forward air control vehicles, cargo carriers, reconnaissance vehicles and (fitted with recoilless rifles or anti-tank guided weapons) highly potent tank destroyers. They have seen action in every corner of the world, from the dense jungles of South East Asia to the arid deserts of North Africa and the Middle East. Every time they have proved themselves to be capable of almost continuous operations with little or no maintenance.

Of all the vehicles covered in this study, it is the Land Rover, M37, M38, M151, Hotchkiss M 201 and the two Soviet vehicles that have seen the most widespread service. Some, such as the Peugeot P4 and the Volkswagen Iltis, have only recently entered service and so have not yet been deployed operationally.

In the near future a new type of light vehicle will enter service, although by its carrying capability of just over one tonne it is almost a truck. This is the American High-Mobility Multi-purpose Wheeled Vehicle (HMMWV), now more commonly known as the Hummer, for which the US armed forces have a requirement of at least 50,000. The Hummer will replace the M151 (4×4) light vehicle and some heavier vehicles as these do not have the required payload, performance or protection for use in future high-intensity conflicts. Many of the light vehicles at present in service were designed to mount only machine-guns but have, in recent years, been pressed into use carrying anti-tank weapons and their ammunition that have overloaded the chassis.

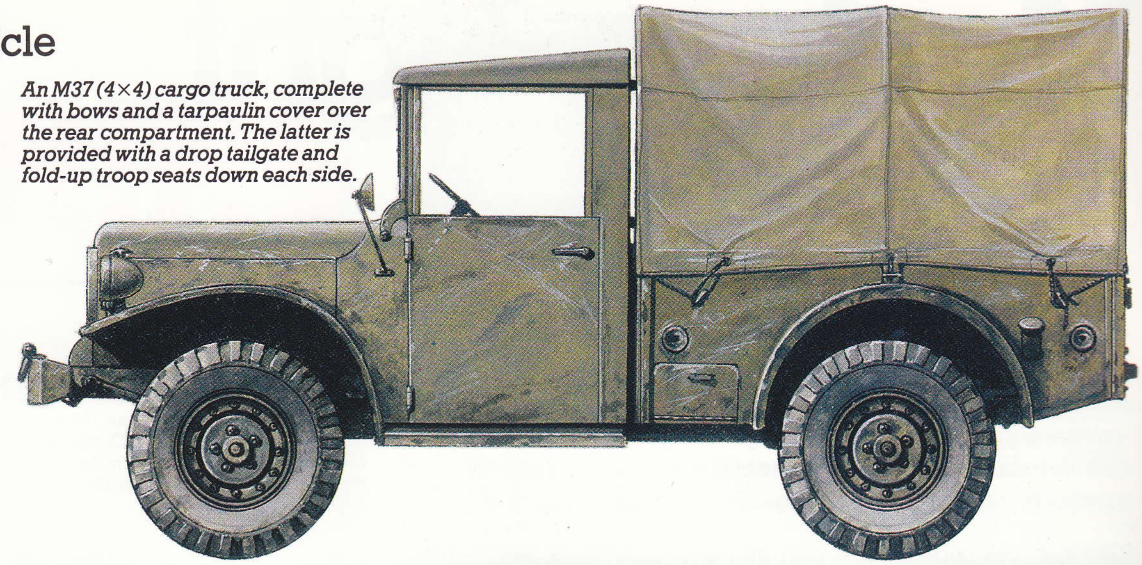
With the ever-increasing costs of defence, many countries are now issuing light 4×2 vehicles to many units as these are more than adequate for many of the roles normally carried out by 4×4 light vehicles in the rear areas. These 4×2 vehicles are not only cheaper to purchase in the first place, but are less costly to run and maintain, a valuable asset.

There is no doubt that light vehicles (4×4, 4×2 or new-generation vehicles such as the Hummer) will be with us for a long time yet.

M151 vehicles of the US Marines were notable in patrolling the streets of Beirut during the ill-fated peacekeeping effort in Lebanon. With more than 100,000 produced, the M151 is in worldwide use, but will be replaced in American service by the High Mobility Multi-purpose Wheeled Vehicle.

USA

M37 light vehicle



An M37 (4×4) cargo truck, complete with bows and a tarpaulin cover over the rear compartment. The latter is provided with a drop tailgate and fold-up troop seats down each side.

The Beep (4×4) light vehicle, or to give its official designation, the T214, was widely used as a command/radio vehicle and forward ambulance during World War II, and was placed back in production to meet Korean War requirements. This was replaced by the **M37**, also produced by Dodge, who built over 125,000 vehicles between 1950 and 1970 for the US Army and many other countries around the world. The M37 was replaced in many units in the 1970s by the M715 series, but insufficient of these were built to replace the M37 on a one-for-one basis.

The basic M37 truck was designed to carry 907 kg (2,000 lb) of cargo on roads or 680 kg (1,500 lb) of cargo across country, and can also tow a trailer weighing 2722 kg (6,000 lb) on roads or 1815 kg (4,000 lb) across country.

In layout the M37 is similar to a standard commercial pick-up, with the engine at the front, the driver and two passengers in the centre, and the cargo area at the rear. The last has a drop tailgate, folding troop seats down each side, removable front rack bows and a tarpaulin cover. The cab has a windscreen that can be folded forward onto the bonnet, on each side a door whose top can be removed, and a removable tarpaulin cover. Some vehicles were fitted with a front-mounted winch for recovery operations, and a deep-fording kit can be fitted which enables the M37 to ford to a depth of 2.133 m (7 ft).

There are a number of variants of the M37, including the **M43** ambulance which has a fully enclosed steel body and can carry eight seated or four stretcher patients and a medical attendant. The rear compartment is provided with a heater and a light. The command post model is similar to the basic cargo model but has side curtains with windows, and internally has a folding table and map light, and can be fitted with communications equipment. The telephone maintenance truck is the **M201** which has an all-steel body with compartments for tools and spare equipment.

The M37 was also made under licence in Canada in the 1950s by Chrysler at Windsor, Ontario, these being called the **M37CDN** cargo vehicle, **M43CDN** ambulance and **M152CDN** fully enclosed panel truck. One of the more unusual Canadian models was an M37CDN with a pedestal mount to the cab rear for launching anti-tank guided weapons.

In the 1950s Japan produced two vehicles very similar to the M37. These were the **Nissan Q4W73** (4×4) 750-kg (1,653-lb) truck and the **Toyota 2FQ15L** (4×4) with a similar carrying capability. Both of these are used by the Japanese Ground Self-Defence Force, and the Nissan vehicle has also been built under licence in India for the Indian army. The Toyota model was also used by United States forces in the Far East, South Vietnam and South Korea. The South Vietnamese fitted many of their vehicles with additional armour protection for convoy escort work and for the patrol of air bases and other targets.

Specification

M37

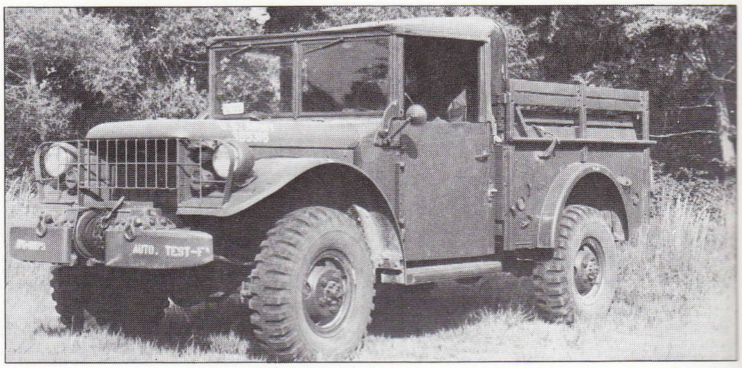
Crew: 1+2 (plus 6/8 in rear)

Weight: empty 2585 kg (5,699 lb) and loaded 3493 kg (7,700 lb)

Powerplant: one Dodge T245 6-cylinder petrol engine developing 78 bhp (58 kW)

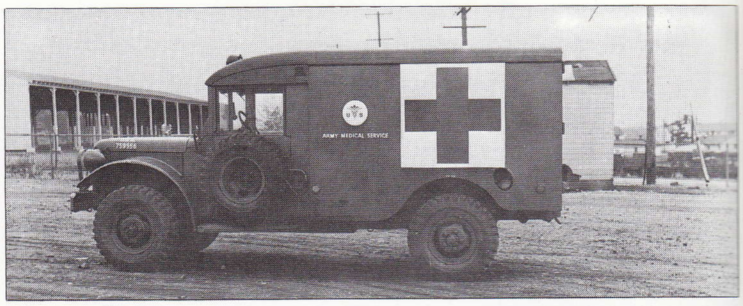
Dimensions: length 4.81 m (15 ft 9 in); width 1.784 m (5 ft 10 in); height 2.279 m (7 ft 6 in)

Performance: maximum road speed 88.5 km/h (55 mph); maximum range 362 km (225 miles); gradient 68 per cent; fording 1.066 m (3 ft 6 in)



Above: Between 1950 and 1970 Dodge built more than 130,000 of these M37 (4×4) cargo trucks for the US armed forces. This particular vehicle has a front-mounted winch.

Below: The ambulance member of the family is designated the M43, and can carry four stretcher patients plus an attendant, or eight seated patients and an attendant.



USA

M38 light vehicle

At the outbreak of the Korean War in 1950, the standard American light vehicle was still the Jeep. But the rapid expansion of the US Army meant that there were insufficient Jeeps, even when units in Europe and elsewhere were robbed of their vehicles. To meet this urgent need the civilian **Willys CJ3A** was fitted with a 24-volt electrical system (to enable it to be fitted with radios), semi-floating rear axle and a deep-fording kit (to enable it to ford to a depth of 1.879 m/6 ft 2 in), and this was standardized as the **M38**. In appearance it was similar to the Jeeps of World War II, and could carry a payload of 544 kg (1,200 lb) on roads or 363 kg (800 lb) across country, and could tow a trailer weighing 907 kg (2,000 lb) on roads or 680 kg (1,500 lb) across country. It could also be fitted with a front-mounted winch.

The M38 was in production from 1950 to 1952, when it was replaced by the **M38A1**, which is powered by a four-cylinder petrol engine developing 72 bhp (53.69 kW), has a longer wheelbase, possesses greater operational range thanks to the provision of a larger-capacity fuel tank, and has the same payload capability as the basic M38. The M38A1 is distinguishable from the M38 as the former has distinct curved sides to the bonnet, while the latter has a flat bonnet that is almost identical to that of the World War II Jeep.

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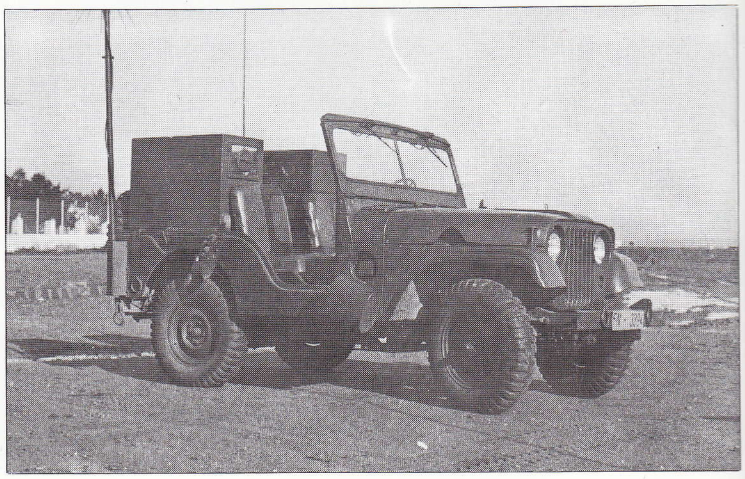


An M38A1 (4×4) light vehicle of the Spanish marines, fitted with radios for use in the command role.

Fast Attack Vehicle

One of the most unusual of the many developments contributing to the new American army of the 1990s is the Fast Attack Vehicle concept, currently under test with the 9th Infantry Division in Washington state.

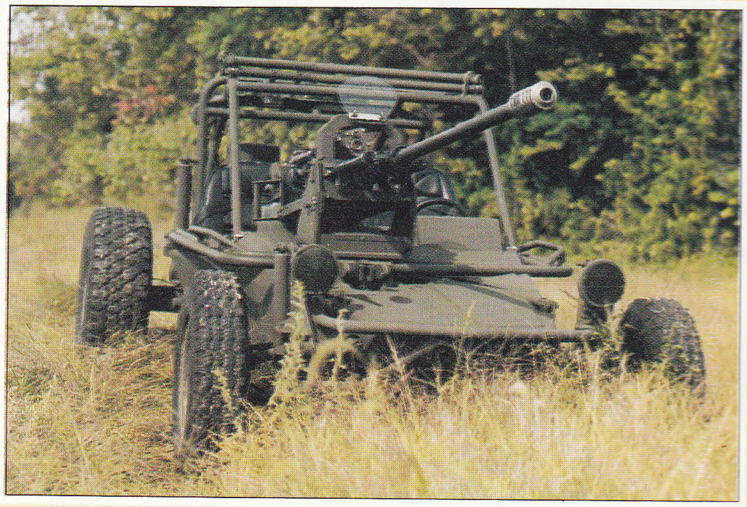
In the past few years the United States has placed greater emphasis on its ability to project power to any part of the world. This has led to the build-up of its strategic transport forces with the Lockheed C-5B Galaxy entering production and the existing Lockheed C-141 StarLifter fleet being 'stretched'. In Europe the US Army has stockpiled massive amounts of tanks, armoured personnel carriers, trucks, artillery and other essential stores so that in the event of war only the manpower has to be flown in to crew vehicles already in place and constantly checked for immediate-use capability. The programme is called POMCUS (Pre-positioning Of Matériel Configured to Unit Sets).

For political and economic reasons it is impossible for the United States to store military equipment in every area of possible conflict. It is therefore expected that in some cases the units would have to fly direct from the United States direct to the risk area. The main drawback is that the equipment for the armoured and mechanized divisions based in the United States is very heavy and it would need thousands of sorties to airlift it to a different theatre of operations; indeed, some of it is so heavy that it could only be carried by sea.

The 9th Infantry Division at Fort Lewis, Washington, has recently been carrying out trials with a wide range of equipment capable of rapid deployment by air to any point in the world. This equipment has ranged from the West German Wiesel light tracked armoured vehicle and Unimog trucks to the Fast Attack Vehicle. The last is the well-known Chenowth Racing Products Incorporated dune buggy, which has been available on the civilian market for some years and has already established a reputation for its exceptional speed across country.

In 1982 Emerson Electric was awarded a contract worth $2 million for 80 Fast Attack Vehicles and all were delivered by December of the same year. The FAV has no armour protection and relies for its survival on its speed and small size. The chassis is essentially a tubular frame with an integral roll-over cage to protect the occupants should the vehicle turn over. The driver is seated in the centre of the vehicle on the left with the gunner/passenger/commander to his right, both crew members being provided with seat belts which are essential when the vehicle is travelling at speed across country. Mounted at the rear is the air-cooled petrol engine which develops 94 hp (70 kW) and is coupled to a manual gearbox with four forward and two reverse gears. There is no transfer box as power is on the rear wheels only. Each front wheel has two high-performance shock absorbers while the rear wheels, which take the greater weight, have three each. Maximum road speed is almost 129 km/h (80 mph).

The FAV can be fitted with a variety of weapons which would normally be mounted on the integral roll bar; these include the 40-mm Mk 19 automatic grenade-launcher, 7.62-mm (0.3-in) or 12.7-mm (0.5-in) machine-guns, Hughes Helicopters 30-mm Chain Gun (as fitted to the Advanced Attack Helicopter already in production for the US Army) or the Hughes Aircraft TOW 2 wire-guided anti-tank weapon.

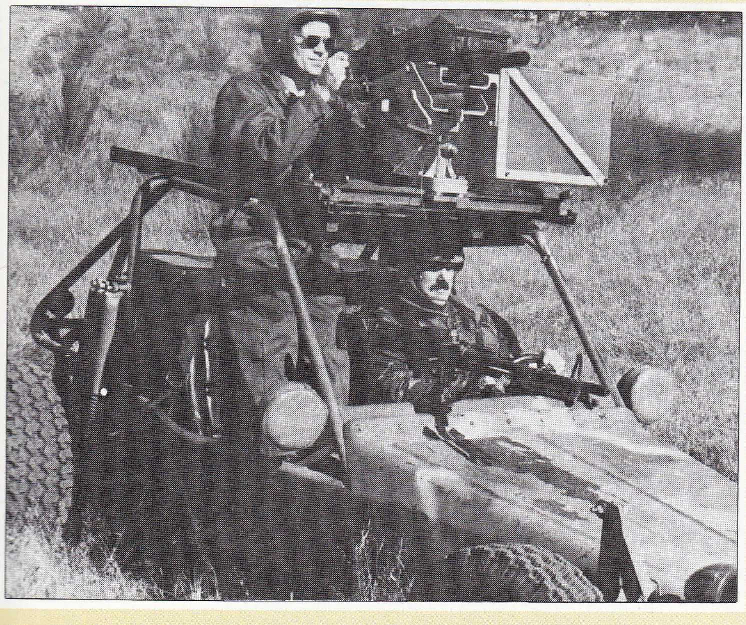


A Fast Attack Vehicle (FAV) showing its integral roll cage and armed with a 30-mm Hughes Helicopters Chain Gun as installed in the Advanced Attack Helicopter. These vehicles are now being tested by the 9th Infantry Division's High Technology Test Bed at Fort Lewis, Washington.

Obviously the Fast Attack Vehicle would not be able to stop a head-on advance by enemy units equipped with main battle tanks and mechanized infantry vehicles and supported by massive artillery fire, but they could be used to strike from the sides and rear where the enemy would not expect or even be prepared for such an attack. Using hit and run tactics, the Fast Attack Vehicle could play a valuable part in operations in the Middle East, where its high power-to-weight ratio, low overall weight and small size would make it an elusive target; and at close quarters a tank turret would not have sufficient speed even to traverse onto the vehicle.

The FAV concept does have limitations, however, and the vehicle would not survive long in high-intensity operations likely to be found in Europe. It also lacks the space to carry sufficient fuel, ammunition and other essential supplies for extended operations, and in such circumstances would have to be supported by other vehicles.

Like any equipment developed today, if it is used for the role for which it was designed the FAV would probably prove to be a major success, but if used in an operational environment such as Europe would probably fail.



Above: The Fast Attack Vehicle is based on the highly successful Chenowth off-road racing vehicle, slightly modified to meet military requirements such as the addition of radios and armament.

Right: Fast Attack Vehicle (FAV), fitted with 40-mm automatic grenade launcher (top) and 7.62-mm machine-gun (bottom) to give suppressive fire. So far more than 80 vehicles have been delivered.

M38 light vehicle (continued)

The layout of the M38 is conventional, with the engine at the front, the driver and one passenger in the centre, and a bench seat for a further two passengers at the rear. The windscreen folds forward onto the bonnet and a canvas top, stowed at the rear when not required, can be quickly erected when the windscreen is raised. Variants of the later M38A1 included the **M38A1C**, which carried a 106-mm (4.17-in) recoilless rifle in the rear that could be fired from the vehicle or dismounted for ground use and also had a split windscreen so that the barrel could be locked along the centre of the vehicle for travelling. The ambulance model of the M38A1 was the **M170**, which could carry three stretcher or six seated patients.

The M38 and M38A1 were replaced in the US Army by the M151 light vehicle, but they remain in service with many other countries around the world, and the type was also made under licence in Canada as the **M38CDN** and **M38A1CDN**, both of which will soon be replaced by the West German Volkswagen Iltis light vehicle built under licence.

In the early 1960s Willys-Overland became Kaiser Jeep, which later became the Jeep Corporation, a subsidiary of the American Motors Corporation, which manufactures a wide range of 4×4 vehicles for the civilian market. Military versions of some of these vehicles are also produced for the export market including the **AM7**, **AM8** and **AM10**, which all have different wheelbases and payloads, although they are all powered by the same Model 258 engine.

Specification
M38

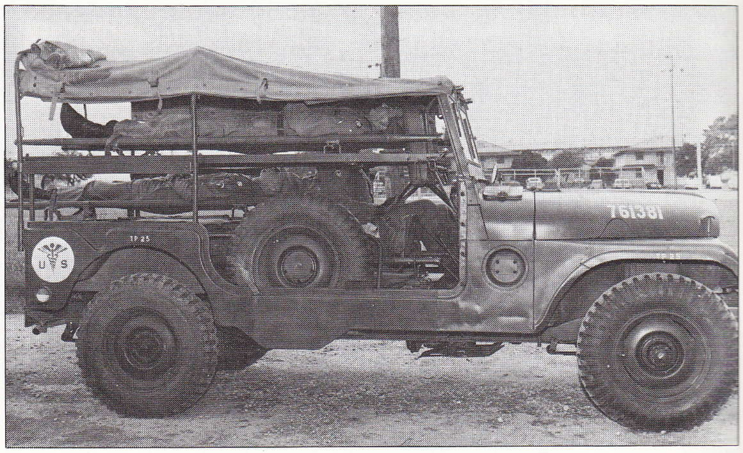
Crew: 1+1 (plus 2 in rear)

Weight: empty 1247 kg (2,749 lb) and loaded 1791 kg (3,948 lb)

Powerplant: one Willys MC 4-cylinder petrol engine developing 60 bhp (44.7 kW)

Dimensions: length 3.377 m (11 ft 1 in); width 1.574 m (5 ft 2 in); height 1.879 m (6 ft 2 in)

Performance: maximum road speed 88.5 km/h (55 mph); maximum range 362 km (225 miles); gradient 65 per cent; fording 0.939 m (3 ft 1 in)



The forward ambulance version of the M38 is the M170, which has a longer wheelbase and can carry three stretcher or six seated patients.

USA

M151 light vehicle

The **M151** is at present one of the most widely used light vehicles in the world, but its development can be traced back to a requirement issued in 1950 for a new ¼-ton vehicle to replace the M38 which was then entering production at Willys. Development of the new vehicle was undertaken by the Ford Motor Company, the first prototypes being completed in 1952 and further prototypes in 1954 under the designation **XM151**. Further development of the latter resulted in the **XM151E1** of steel construction, and in the **XM151E2** of aluminium construction. The former was eventually selected for production, and the first vehicles came off the production line at Ford's Highland Park Plant in 1960 under the designation M151. In 1984 the vehicle was in service with some 100 armies in almost every corner of the world, but production is now undertaken by AM General Corporation at its Sound Bend Facilities. This company has produced over 100,000 vehicles, though none of the type have been ordered by the US Army in recent years as the engine does not meet stringent emission standards. Thus all production is now for export. The M51 has seen action with American forces in Vietnam, where the vehicle was used for a wide range of roles, some even being fitted with armour protection.

The original M151 was followed in production by the **M151A1**, which had improved suspension, while the **M151A2** that followed in 1970 had modified lighting, two-speed wipers, modified rear suspension, collapsible steering wheel and a dual brake system. The **M151A2LC** has different gearbox, transfer box and suspension. There are many variants of the M151 including the **M107/M108** communications vehicles, **M718** ambulance which can carry one stretcher and three seated patients (or various combinations of stretcher patients and sitting patients), and the **M825** fitted with the M40 106-mm (4.17-in) recoilless rifle.

The basic M151 series can carry 554 kg (1,221 lb) on roads or 362 kg (798 lb) across country, and can tow a trailer weighing 970 kg (2,138 lb) on roads or 680 kg (1,499 lb) across country. A variety of kits can be fitted including a heater, fully enclosed hard top, searchlight, front-mounted winch, 100-amp alternator and a kit to enable the vehicle to ford to a depth of 1.524 m (5 ft), the last kit being widely used by the US Marine Corps when driving the vehicle out of landing craft during amphibious operations.

The layout of the vehicle is similar to other vehicles of this type, with the engine at the front, the driver and one passenger in the centre, and a bench seat at the rear. The engine is coupled to a manual gearbox with four forward and one reverse gear and a single-speed transfer box that enables the driver to select either 4×4 or 4×2 drive. The suspension, front and rear,

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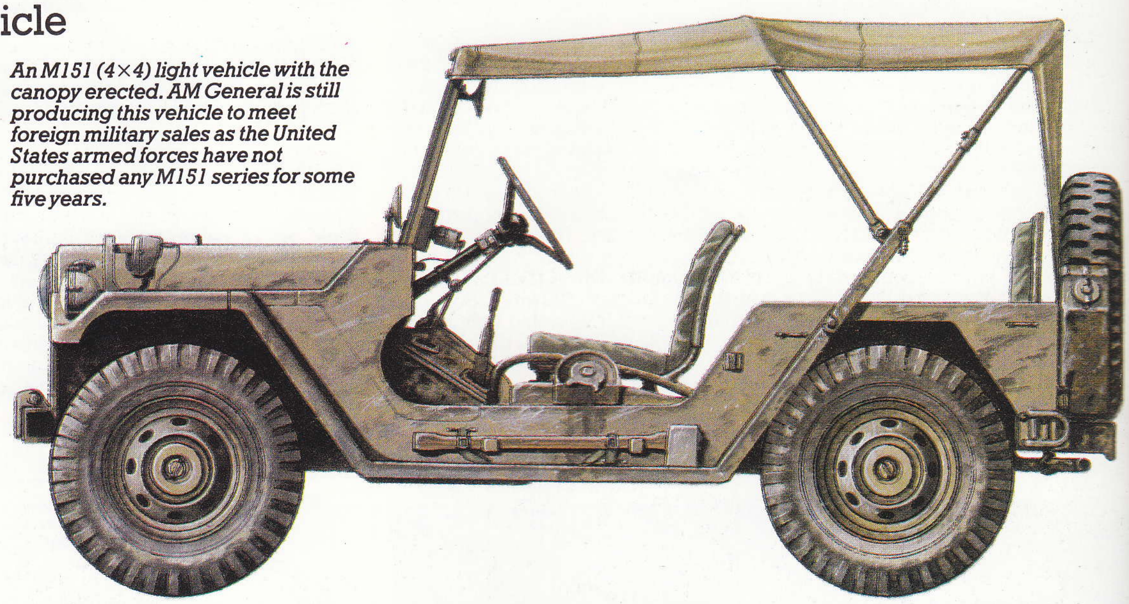
An M151 (4×4) light vehicle with the canopy erected. AM General is still producing this vehicle to meet foreign military sales as the United States armed forces have not purchased any M151 series for some five years.



Below: Since 1960 the M151 has been the standard light vehicle of the US Army and many other armies in every corner of the world. From 1984 it will start to be replaced by the High Mobility Multi-purpose Wheeled Vehicle, or Hummer.

Hummer Competition

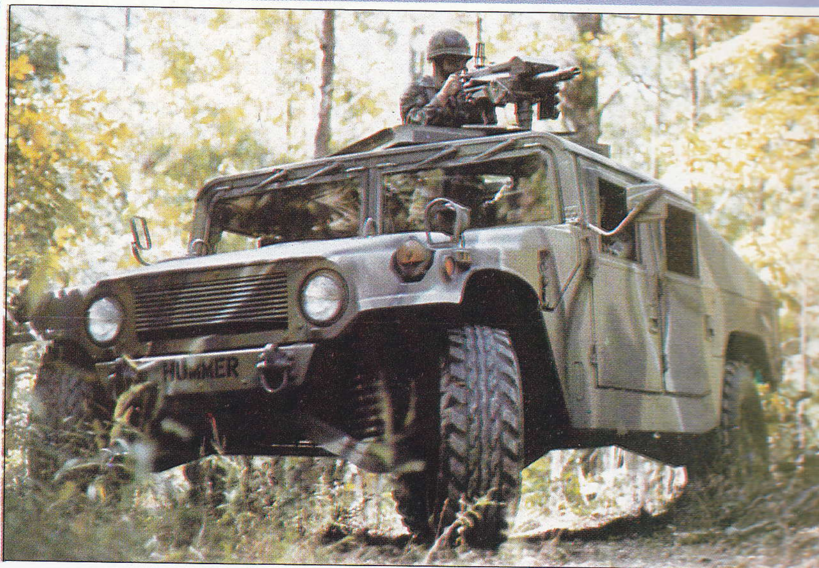
Entering service in 1984, the High Mobility Multi-purpose Wheeled Vehicle (HMMWV, or 'Hummer') will rationalize US armed forces' light utility vehicle procurement to a considerable extent.

For many years the US Army has been operating a bewildering range of light vehicles including the M274 (4×4) Mechanical Mule, M151 (4×4) ¼-ton light vehicle, M37 (4×4) ¾-ton light vehicle and the M715 (4×4) 1¼-ton and M561 (6×6) Gama Goat vehicles. Many of these were well over 10 years old and becoming increasingly difficult to maintain. Moreover, in many cases there were insufficient vehicles to meet requirements: in 1981, for example, the US Army had a requirement for some 30,000 M561 type vehicles but had only 11,000 on strength. The situation for the M151 is even more acute: the US Army has not purchased any such vehicles since 1978 as its petrol engine no longer meets the government's stringent emission-control standards. Some 60,000 of these vehicles remain in service, the majority built between 1966 and 1969.

These vehicles are being replaced by two main types, the Commercial Utility Cargo Vehicle (CUCV) and the High-Mobility Multi-purpose Wheeled Vehicle (HMMWV). To meet the requirement for the CUCV, 26 commercial vehicles were put through an exhaustive series of trials at Aberdeen Proving Ground, Maryland, which is just north of Washington, DC. The US Army then selected the General Motors Model K and placed an order worth just under $700 million for over 53,000 vehicles, the first of these being delivered in 1983. This vehicle is a standard commercial vehicle with the minimum of modifications to suit it for military use, for example military paint, tow hooks, slave kit, 28-volt electrical system and so on. All versions are powered by the same 6.2-litre diesel coupled to an automatic transmission and two-speed transfer case. Five basic 4×4 versions are being procured, namely utility, cargo, ambulance, truck and cargo shelter carrier.

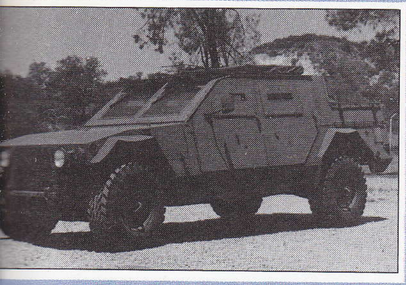
To meet the requirement for the HMMWV five companies (out of 61 approached) submitted proposals to the Tank Automotive Command in early 1981, and in July the same year AM General Corporation, Chrysler (now the Land Systems Division of General Dynamics) and Teledyne Continental were each awarded a contract for the supply of 11 prototype vehicles. After these vehicles had been put through tests at various locations in the United States, the AM General entry was selected for standardization early in 1983, with first production vehicles to be completed in 1984. The initial contract is for some 53,973 vehicles worth $1,184 million with a 100 per cent option. Of the initial order, 38,085 vehicles are for the US Army, 13,196 for the US Marines and the remaining 2,692 for the US Air Force.

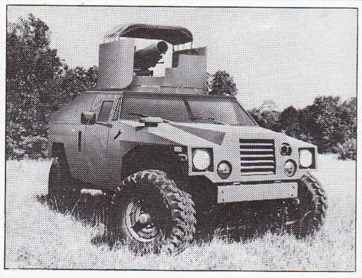
Compared with the vehicles that it is replacing, the HMMWV has a greatly increased carrying capability, improved cross-country performance, higher speed and longer range of operation. The engine is at the front, four individual seats in the centre and a cargo carrying area at the rear, with roll-over protection provided as standard. The basic model is unarmoured, although an appliqué armour kit will be available, as will a wide range of other equipment such as winches.

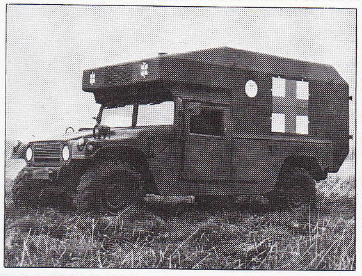

An HMMWV fitted with a roof-mounted 40-mm automatic grenade launcher to provide suppressive fire. The first of at least 55,000 HMMWVs is to be handed over in 1984, with the prime contractor being AM General Corporation. Production is being undertaken at Mishawaka, Indiana.

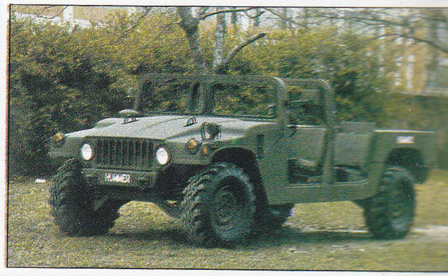
The HMMWV will be used to mount a variety of weapon systems at present carried on the M151 light vehicle, including the Hughes TOW ATGW system and the Stinger surface-to-air missile system. With the rear seats folded down the vehicle can carry the standard S-250 communications shelter, which is at present carried by heavier vehicles. There will also be communications vehicles and a forward ambulance with a fully enclosed rear body. The manufacturer, AM General, has already mounted the Hughes Helicopters 25-mm Chain Gun on the vehicle for trials purposes; this weapon is the same as that installed in the M2 Bradley infantry fighting vehicle, and can inflict severe damage on the side armour of Soviet tanks and knock out most armoured personnel carriers likely to be encountered on the battlefield of the future.

To keep costs to a minimum the engine, transmission, transfer case, integral power steering and brakes are taken from standard production lines. Run-flat tyres are fitted as standard, and as an option a central tyre-pressure regulation system can be installed.


One of the prototypes of the Teledyne entry in the competition.


A General Dynamics HMMWV fitted with Hughes TOW ATGW system.


A prototype of the AM General HMMWV in the ambulance role.


An AM General HMMWV in stripped configuration, to show seats.

In US Army service, the new HMMWV will replace the M151, M272, M561 and M880 series vehicles and will have much greater carrying capability.

One of the prototypes of the AM General High Mobility Multi-purpose Wheeled Vehicle (HMMWV) in the weapons carrier configuration.

M151 light vehicle (continued)

consists of coil springs and hydraulic shock absorbers.

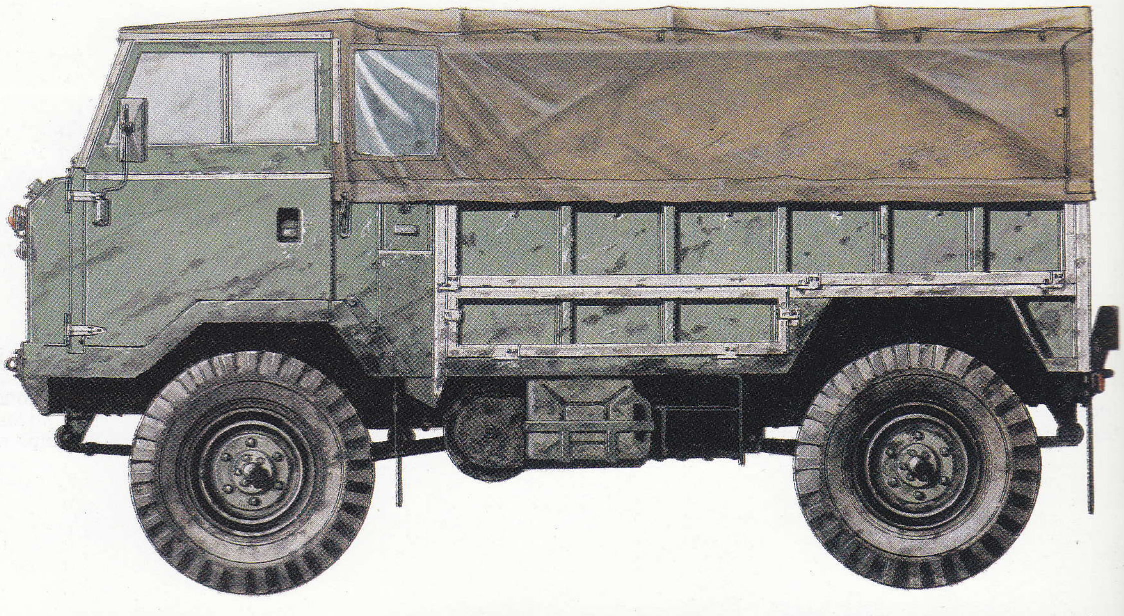
The M151 is widely used by the US Army to mount such weapons as 7.62-mm (0.3-in) or 12.7-mm (0.5-in) machine-guns or the Hughes TOW ATGW system. The M151 will soon start to be replaced by the High Mobility Multi-purpose Wheeled Vehicle (also built by AM General), which will have greatly increased carrying capability and better off-road performance.

Specification
M151
Crew: 1+1 (plus 2 in rear)
Weight: empty 1012 kg (2,231 lb) and loaded 1575 kg (3,472 lb)
Powerplant: one 4-cylinder petrol engine developing 72 hp (53.69 kW)
Dimensions: length 3.352 m (11 ft 0 in); width 1.58 m (5 ft 2 in); height 1.803 m (5 ft 11 in)
Performance: maximum road speed 106 km/h (66 mph); maximum range 483 km (300 miles); gradient 60 per cent; fording 0.533 m (1 ft 9 in)

An M151 (4×4) light vehicle of 17th Cavalry with a pintle-mounted 7.62-mm (0.3-in) M60 machine-gun during Operation 'Junction City', Phase II, in South Vietnam, 1967.

UK

Land Rover 1-Tonne light vehicle



When the long-wheelbase **Land Rover** was introduced into service in the 1950s, it was more than adequate to tow weapons such as the OTO Melara 105-mm (4.13-in) Model 56 Pack Howitzer used by the Royal Artillery from 1960. It was realized that in the future heavier weapon systems would be introduced into service, so a requirement was drawn up for a 4×4 vehicle with a cross-country payload of 1000 kg (2,205 lb) and also the ability to tow a powered trailer carrying 1500 kg (3307 lb). This vehicle was subsequently designed by Land Rover in co-operation with the Military Vehicles and Engineering Establishment at Chertsey, Surrey. The first prototypes were completed in the mid-1960s, but as a result of trials a number of modifications were carried out and it was not until 1975 that the first production **Land Rover 1-Tonne** vehicles were issued to British army units. For a variety of reasons less than 3,000 vehicles were built, most of them being supplied to the British army and Royal Air Force, although overseas sales were made to Australia (for the Rapier SAM), Egypt (for the Swingfire ATGW system) and Luxembourg. The main reason for this relative short production run, almost insignificant by Land Rover standards, was that it was designed specifically for military use, whereas the basic Land Rover was developed as a commercial vehicle but later adopted by the military.

In the British army the Land Rover 1-Tonne is used to tow the Royal Ordnance Factory Nottingham 105-mm (4.13-in) Light Gun, to carry 81-mm (3.19-in) mortar teams in UK-based infantry battalions, to carry MILAN anti-tank teams (two launchers and 14 missiles), and to tow the Rapier SAM launcher, its missile resupply trailer and the Blindfire radar system. There is also a model with a fully enclosed body for use in the ambulance role, and this can carry four stretcher or six sitting patients in addition to its crew. Another fully enclosed body version is used in the communications/electronic warfare role.

The Land Rover 1-Tonne is of the forward control type, with the driver at the front right and passenger on the left with the engine between and below their seats. The engine is basically a standard commercial model (but with a reduced compression ratio to enable it to run on low-octane fuels) and is coupled to a manual gearbox with four forward and one reverse gear. The transfer box is of the two-speed type with permanent four-wheel drive. The cargo is at the rear and has bows and a tarpaulin cover.

For air transport the complete hood, body sides, windscreen, bumpers, doors, bows and tarpaulin cover can be quickly removed, so reducing the overall weight of the vehicle to only 1580 kg (3,483 lb).

Now that the Land Rover 1-Tonne is out of production, the **Gomba Stonefield** (4×4), **Dosco HS 100-4** (4×4) and **Reynolds Boughton** (4×4) ranges of trucks are being offered by British industry to fill the gap in the market. The Gomba Stonefield has already been recommended for use as the towing vehicle for the 105-mm (4.13-in) Light Gun, and this vehicle is now in service with the Malaysian army.

Specification
Land Rover 1-Tonne
Crew: 1+1 (plus 8 in rear)
Weight: empty 1924 kg (4,242 lb) and loaded 3120 kg (6,878 lb)
Powerplant: one Rover V-8 petrol engine developing 128 bhp (95.5 kW)
Dimensions: length 4.127 m (13 ft 6 in); width 1.842 m (6 ft 1 in); height 2.138 m (7 ft 0 in)
Performance: maximum road speed 120 km/h (74 mph); maximum range 560 km (348 miles); gradient 60 per cent

Above: The 1-Tonne Land Rover was developed specifically to meet the requirements of the British armed forces by Land Rover and the Military Vehicles and Engineering Establishment. Typical roles in the British army include towing the 105-mm (4.13-in) Light Gun and the Rapier surface-to-air missile.

Below: A 1-Tonne Land Rover towing a trailer. In addition to the British army and Royal Air Force Regiment, sales were also made to Luxembourg, Egypt (for the Swingfire ATGW system), and to Australia for the Rapier. It is no longer in production and was not produced in very large numbers.

Land Rover in Action

Since its introduction to British army service nearly 30 years ago, the Land Rover has proved a faithful servant from the Arctic Circle to the Equator. Manufactured in more than 20 countries, the Land Rover's rugged reliability has found favour with armed forces worldwide.

Unloading from an RAF Hercules, this Land Rover is destined for the United Nations peacekeeping force in Cyprus. An airportable version, many body parts can be removed to lighten the vehicle.

Of all the light vehicles developed since World War II, it is the British Land Rover that is probably the most famous. During World War II the British army was supplied with large numbers of Jeeps by the United States, and these remained in use for many years after the end of the war, some being used by the Parachute Regiment as late as the Suez crisis of 1956.

Towards the end of World War II, however, the Nuffield Organization started work on a 4×4 light vehicle for the British army which became known as the Gutty. The first prototypes of this were completed in 1947, and were powered by a four-cylinder engine. Further development resulted in the Mudlark powered by a Rolls-Royce four-cylinder petrol engine, and still more development resulted in the Austin Champ (FV1801) which was selected to become the standard light vehicle in the British army in the 1950s. The main drawback of the Champ was that it was a complicated vehicle, mainly because the user required the Champ to have a deep-fording capability which necessitated extensive waterproofing of the engine, axles and electrical system. The Austin Champ was finally phased out of service in the 1960s and replaced by the Land Rover

The origins of the Land Rover can be traced back to the end of World War II, when the British government decided to ration steel to those motor manufacturers who could obtain the most exports. For the Rover Company at Solihull this caused serious problems as the manufacturer produced rather expensive cars that in the harsh economic conditions at that time proved difficult to export. The company therefore decided to build a vehicle that would attract customers from industrial and agricultural markets around the world. The first prototype of this vehicle was completed in 1947, and was shown for the first time at the April 1948 Amsterdam Motor Show. This vehicle, called the Land Rover, was an almost immediate success and production started at Solihull in the same year.

The first model of the Land Rover used the engine of the company's Rover P3 '60' car and was fitted with a canvas hood. The next model shown was a fully enclosed estate version that could seat six people including the driver. These vehicles all had a 2.032-m (80-in) wheelbase, this being the distance between the centre of the front road wheel and the centre of the rear road wheel. From then on the development of the Land Rover was rapid, and it is possible only to highlight some of the more important improvements in this short article. In 1954 the 2.032-m (80-in) version was replaced in production by a 2.184-m (86-in) model, and the same year the first long wheelbase model was introduced with a wheelbase of 2.717 m (107 in) and the ability to carry 750 kg (1,653 lb). Two years later the 2.184-m (86-in) model was replaced in production by the 2.23-m (88-in) model and the 2.717-m (107-in) version by the 2.768-m (109-in) version, and these basic wheelbases remain the same today. In 1956 the British army finally selected the Land Rover as the replacement for the Austin Champ. From then on more and more armies around the world selected the Land Rover, examples being Australia in 1959 and Switzerland in the following year.

In later years different engine options were offered, and in 1966 a forward control Land Rover was introduced; this latter was used by a number of armies, including that of Spain, but is no longer in production. In 1968 Land Rovers had their headlamps moved from the grille to

Service in Malaya, Borneo and latterly in Belize has given the Land Rover a series of very tough tests. Conditions are extreme, with heat, mud, humidity and the torrential rain of the equatorial forest making travel very difficult.

In the Radfan, north of Aden, Land Rovers faced different problems. The campaign to stem the flow of Yemeni arms to insurgents in Aden put great strains on men and equipment, with searing heat, little water, rocky terrain and sand and grit with everything.

the forward mudguards to meet new lighting requirements introduced in the Low Countries. Two years later the 1-tonne and ½-ton models were announced, these being the first Land Rovers developed specifically for military use. Two years later the Range Rover was introduced for the civilian market, and this too has been adopted by a number of armies for special roles. For example the British Royal Military Police use it, and many Middle East armies have the type for the escort of VIPs and heads of state, these vehicles being more comfortable than the basic Land Rover.

By 1971 half a million Land Rovers had been built, and by 1976 this had reached the one million mark. In addition to being produced in the United Kingdom, Land Rovers are assembled or manufactured by more than 20 other plants in every corner of the world, some of these plants being owned by Land Rover but others by local companies.

The most recent version to be introduced is the 2.79-m (110-in), commonly known as the One-Ten, which can carry 1463 kg (3,225 lb) of cargo and is powered by a choice of three different engines (2.5-litre petrol or diesel, or 3.5-litre V-8 petrol).

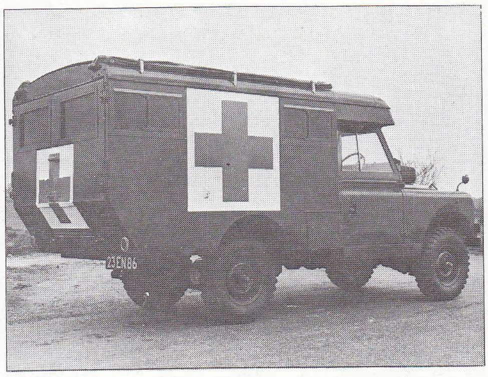
One of the secrets of the success of the Land Rover is the wide range of optional equipment available for the vehicle: another, that the company can build batches of vehicles to suit overseas countries' specific requirements. Typical optional extras include a front-mounted winch, overdrive, modified suspension, fire extinguisher and lamp guards, the last being essential in some parts of the world. There are so many variants of the Land Rover that it is possible only to describe two models in any detail, namely the airportable and long-wheelbase versions.

Airportable Land Rover

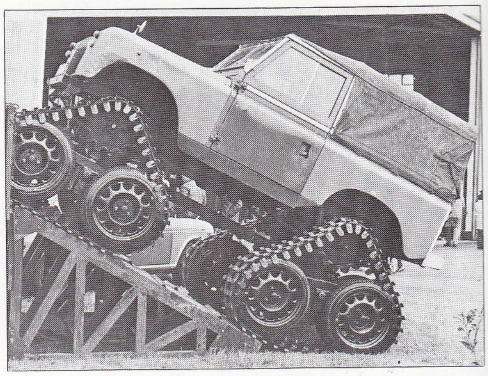
The airportable Land Rover was developed by Rover and the Military Vehicles and Engineering Establishment specifically to meet the requirements of the British army, Royal Air Force and Royal Marines. However since its introduction it has also been adopted by a number of other countries including Belgium, Brunei, Jamaica, Libya, the Netherlands, Saudi Arabia and Sudan.

The vehicle (like other Land Rovers) has an all-welded box section chassis of the ladder type to which the body is attached. The engine is at the front, the driver and two passengers in the centre, and the cargo area at the rear. The last has a bench seat down each side for four further passengers and a drop tailgate for the rapid loading and unloading of cargo. What makes this model different from the normal 2.23-m (88-in) Land Rover, with which it shares many components including the engine, gearbox, axles, suspension and brakes, is that the hood, body sides, windscreen, doors, bumpers and spare wheels can quickly be removed to reduce the overall weight of the vehicle, this being essential for airborne operations. The airportable Land Rover is available with a four-cylinder petrol or diesel engine, the former being the more powerful. The engine is coupled to a manual gearbox with four forward and one reverse gears and a two-speed transfer box. The basic model has a 12-volt electrical system, but when the type is used in the radio role a 24-volt system is installed, the two batteries being installed in place of the central passenger seat. The radio aerials are normally mounted one on each wing and the radios to the rear of the driver and passenger. The airportable Land Rover has a maximum cross-country payload of 564 kg (1,243 lb) and can tow a trailer weighing 1130 kg (2,492 lb). Apart from the radio model the only version used by the British armed forces is a forward ambulance which is the basic vehicle with racks for stretchers and a longer canopy that overhangs the rear. For the export market Marshall of Cambridge, who supply most of the bodies used on British army trucks (for example Bedford and Foden), designed a version of the Airportable Land Rover to carry the American 106-mm (4.17-in) M40 recoilless rifle, which can also be dismounted for use in the ground role; on the normal version the spare wheel and tyre is carried on the bonnet but on this version it has been moved to the right side.

British paratroopers patrol the line of walls, fences, tripwires, mines and watch towers that divide East and West Germany.



Based on the LWB Land Rover, the forward ambulance can carry four stretcher patients and one medical orderly.



This RAF Land Rover was mainly used in bomb disposal work, the four sprocket-driven tracked bogies giving nearly 2½ ft ground clearance.

On Ulster streets, this Green Howard patrol is using standard military Land Rovers. In many cases, however, Land Rovers have been armoured against small arms fire and given what protection may be available against culvert bombs or mined roads. Too often, such a detonation leads to destruction of the vehicle and injury or death to the occupants.

Other modifications have included stowage for ammunition (106-mm/4.17-in recoilless rifle and 12.7-mm/0.5-in ranging machine-gun), barrel clamp on the dashboard, split windscreen and a blast shield for the bonnet.

Long-wheelbase Land Rover

Today the long-wheelbase Land Rover is probably the most widely used of all the military Land Rovers, and in the British armed forces is the standard vehicle in its class, being used to carry 850 kg (1,874 lb) and tow a trailer of weapons weighing up to 1500 kg (3,307 lb). Its layout is identical to that of the airportable model except that each of the rear bench seats can carry three or four men instead of two. The optional equipment depends very much on the requirements of the user, but standard equipment includes provision for stowing a rifle on the dashboard ready for immediate use, military tow hook at the rear, vehicle lashing eyes front and rear, twin fuel tanks, FV pattern lights, stowage for shovel, pick and axe on the tailboard, water jerrican stowage, freight lashing points in the rear and double front and rear bumpers designed for pushing disabled vehicles.

In addition to carrying troops, the long-wheelbase Land Rover is also used to tow a variety of equipment such as the 105-mm (4.13-in) OTO Melara Model 56 pack howitzer, Rapier SAM system and its Blindfire radar (although in the British forces the 1-tonne Land Rover now undertakes this role) and radars such as the British Cymbeline. The chassis is also used as the basis for a forward ambulance with a fully enclosed rear body by Marshall of Cambridge. This can carry four stretcher patients and one medical orderly, or one or two stretcher patients and three seated patients. The British army also uses the long-wheelbase version with a fully enclosed rear body in the command and communications roles, a standard model with the Field Artillery Computer Equipment (FACE), and with a box body fitted with a surveillance radar. The chassis is also used as the basis for the fully armoured Shorland Armoured Patrol Vehicle fitted with a turret armed with a 7.62-mm (0.3-in) machine-gun and for the SB.401 armoured personnel carrier; sales of these vehicles have been made to more than 30 countries, and the Shorland is used in Northern Ireland. The British army did use a version of the long-wheelbase Land Rover fitted with the Wombat 120-mm (4.72-in) recoilless rifle, but this has been replaced by the Euromissile MILAN ATGW system which has a much longer range. In the British armed forces the 2.768-m (109-in) Land Rover will probably be replaced by the 2.79-m (110-in) with its much increased carrying capacity.

Land Rover in action

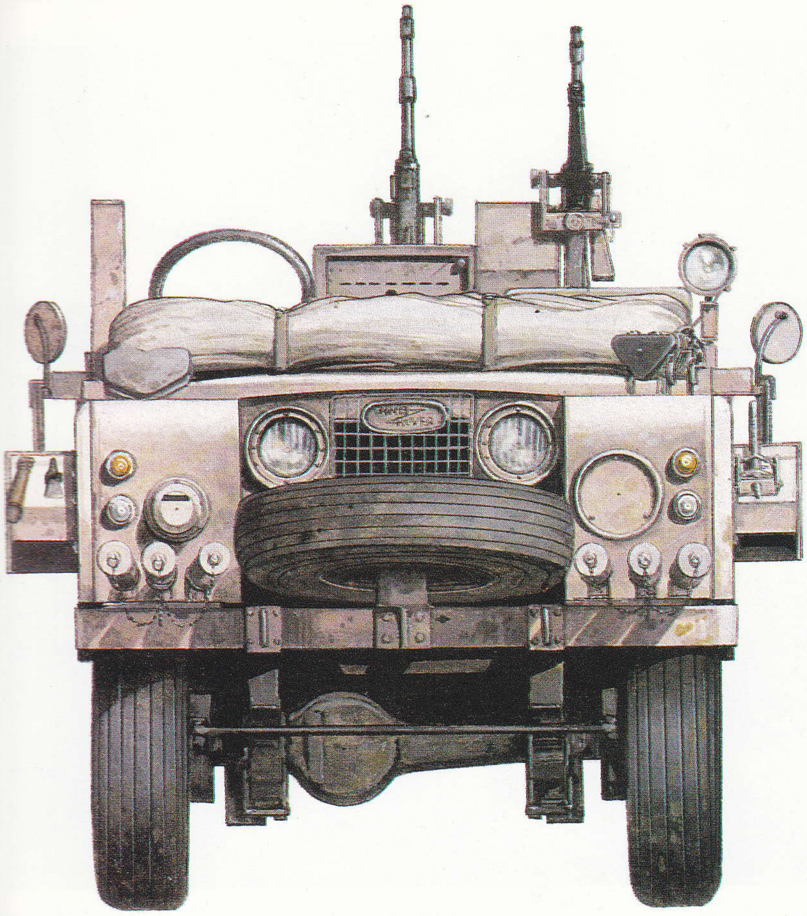
The Land Rover has seen action in almost every corner of the world. One of the most famous versions is that designed for the Special Air Service (SAS), and these vehicles have been widely used in the Persian Gulf; painted pink to blend in with the surrounding area, these were commonly known as Pink Panthers. These were based on the long-wheelbase chassis and fitted with smoke dischargers front and rear, radios, machine-guns, navigational equipment, sand-crossing channels and so on to enable them to operate in areas of shifting sands.

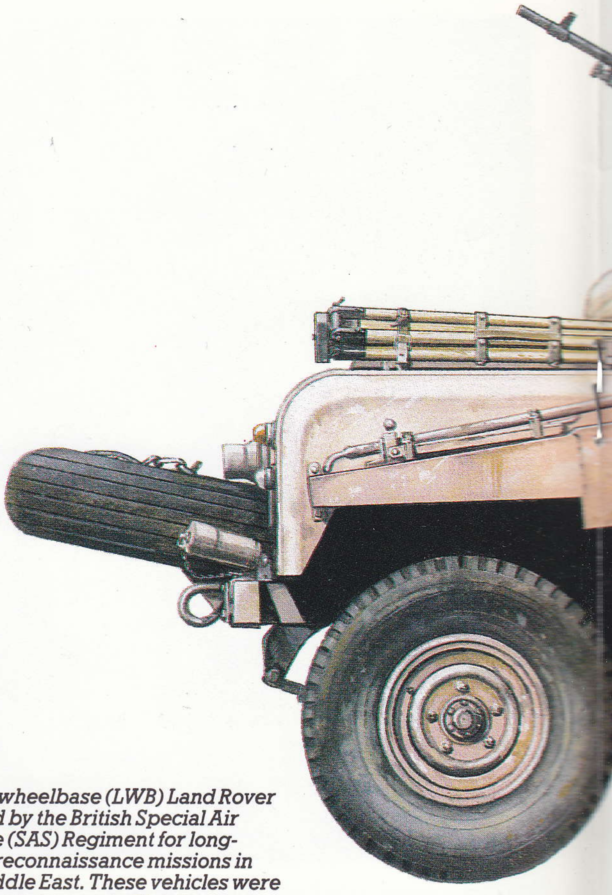
In Northern Ireland Land Rovers have been fitted with additional armour to protect their occupants against small arms fire, and extensions in the form of flexible skirting to stop bombs being thrown under the vehicles, which normally have no protection against mines on the undersides. When terrorists place bombs under roads or culverts they will destroy not only light vehicles such as the Land Rover but even armoured personnel carriers such as the Alvis Saracen.

For use by the ceasefire monitoring force in Rhodesia (now Zimbabwe), Land Rovers were airlifted from England after being fitted with additional armour protection and roll-over bars in the centre of the vehicle: if a vehicle does hit a mine it will probably be blown over, the occupants often being killed or injured by the vehicle falling on top of them; but if they are wearing seatbelts and the roll-over bar is fitted their chances of survival are increased.

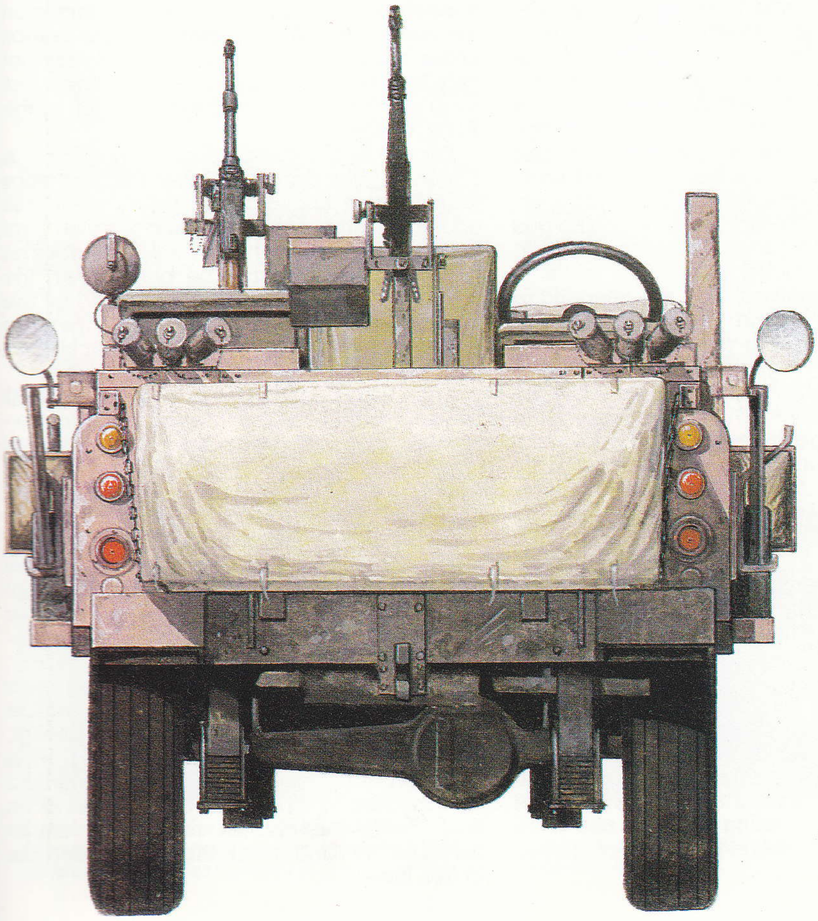
In the recent fighting in the Middle East Land Rovers were in some evidence, including examples fitted with American M2 HB 12.7-mm (0.5-in) or Soviet 12.7-mm (0.5-in) DShKM heavy machine-guns, while others were used to tow light artillery around in addition to their normal cargo-carrying missions.

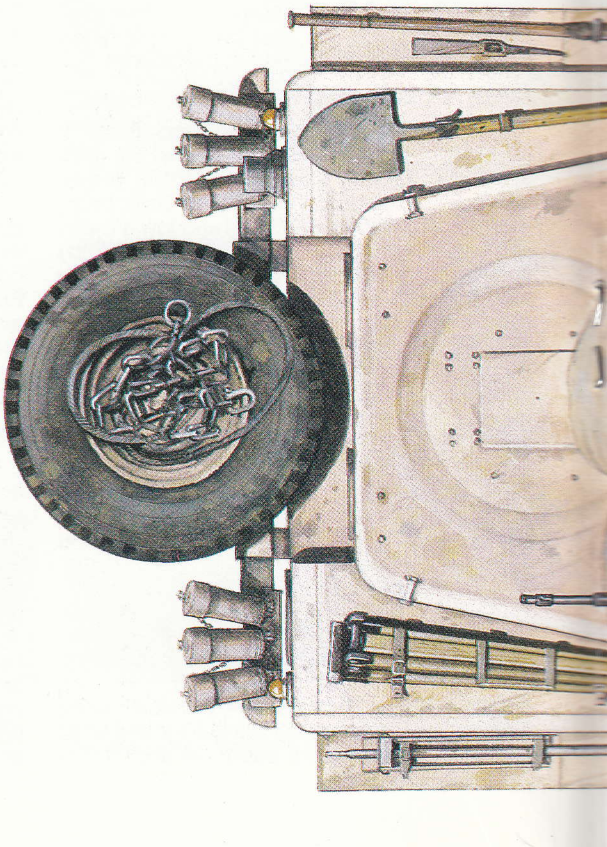
There have been a number of efforts to give the Land Rover an amphibious capability, but none of these merited service use. One of the more interesting amphibious kits was developed by RFD Limited of Godalming, Surrey. It consisted of four rubberized fabric air bags inflated by the exhaust system of the vehicle and each supported by a light alloy framework; propulsion when afloat was provided by a propeller at the rear run off the rear axle; and steering was by turning the front wheels as on land. There was also an air-cushion vehicle based on the Land Rover, this being called the Hover Rover!

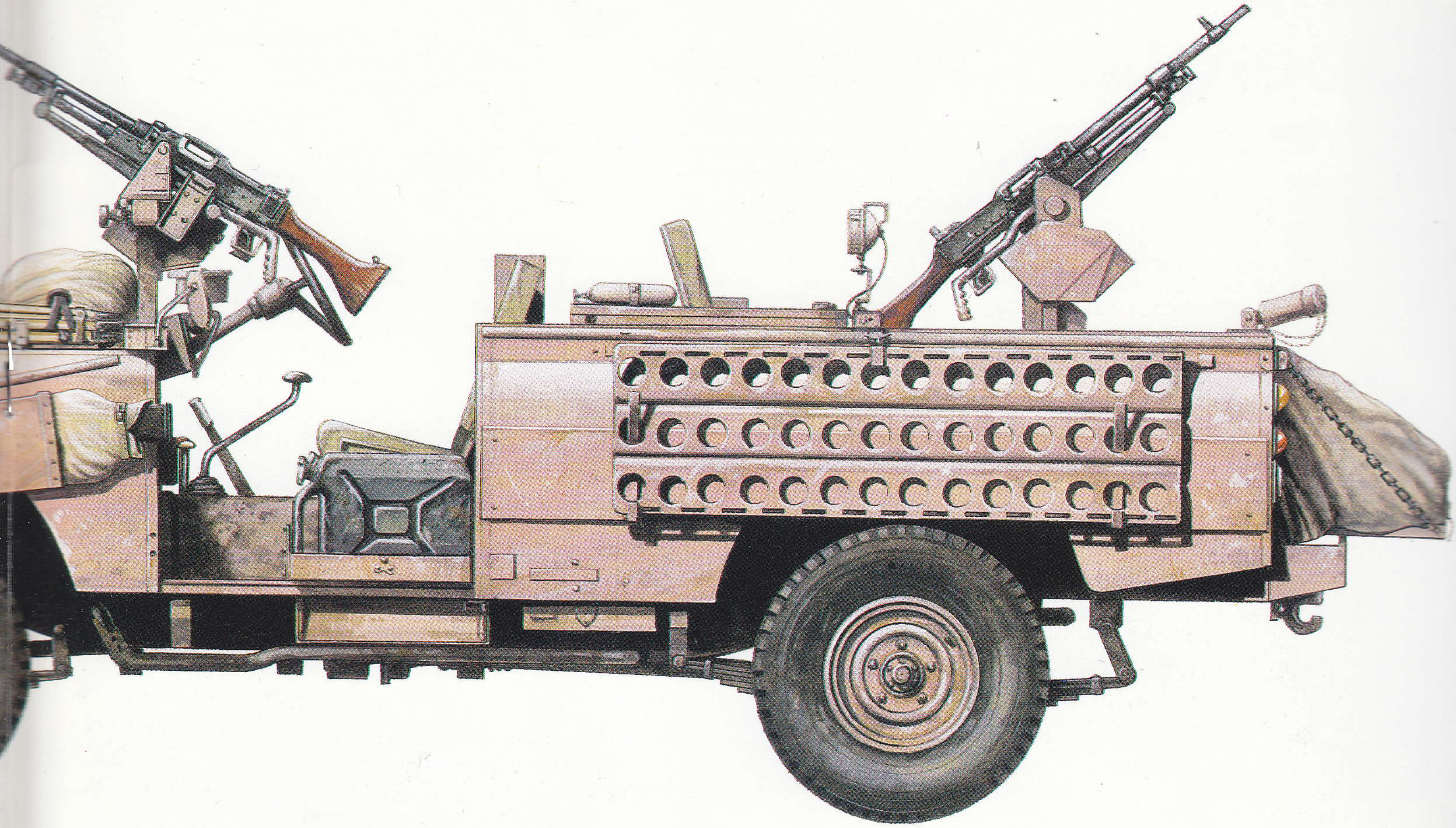


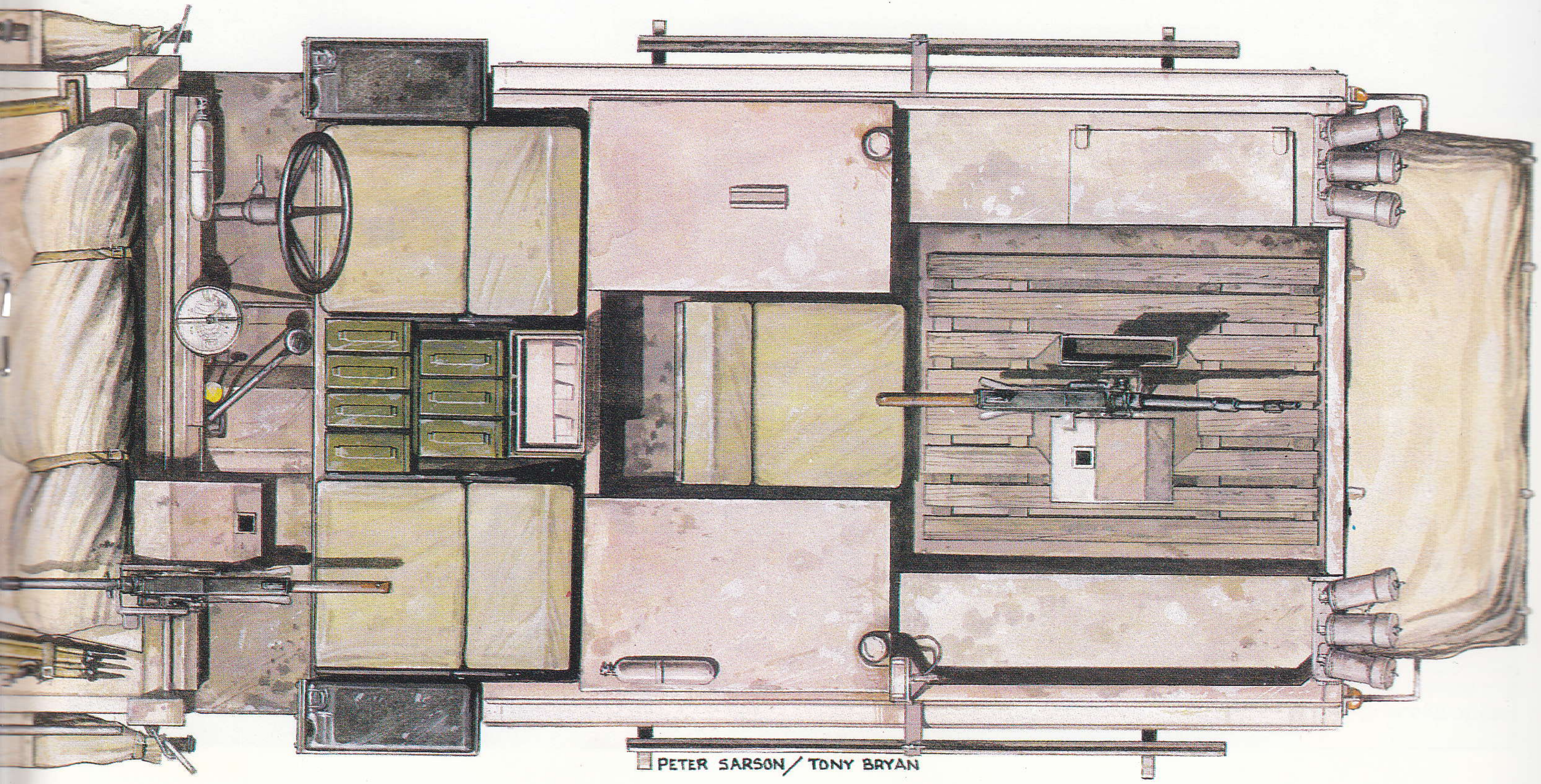


A long wheelbase (LWB) Land Rover as used by the British Special Air Service (SAS) Regiment for long-range reconnaissance missions in the Middle East. These vehicles were commonly known as Pink Panthers, and were fitted with 7.62-mm (0.3-in) General Purpose Machine Guns, smoke dischargers front and rear, sand channels, navigational equipment, water and fuel cans and external stowage to meet the hard operating conditions.








PETER SARSON/ TONY BRYAN

Land Rover in Action: Operation 'Protea'

Land Rovers have seen much action in southern Africa, the rough tracks and long distances involved in operations proving a stern test to the endurance and reliability of any vehicle. The following is a representation of the many operations carried out by South African forces along the Namibian/Angolan borders in their continuing actions against SWAPO guerrillas.

The African night was, as always, very dark but the dim lights of the Land Rover showed enough to pick the way through the bush. The engine was kept in low gear, but it was no use revving too hard as the vehicle was on the last approaches to the SWAPO camp that was still a few kilometres ahead. Ahead the Bushman scouts padded along, looking rather incongruous as their small stature contrasted sharply with the large R4 assault rifles they carried along with their diminutive bows and arrows for the silent kills so feared by the SWAPO guerrillas. As they went the Bushmen slashed at branches to mark a possible route for the Land Rover to follow. If the Land Rover could beat a path through the bush the Ratels could follow. The Land Rover carried a small party of four men, the battalion group second-in-command, a sergeant, the driver and a signaller. They were the trail blazers for the last part of the operation known to them all as Operation 'Protea'. All the South African incursion sweeps into Angola have been named after flowers, and this operation was no different. They all followed a set pattern.

After a period of prolonged quiet along the border between South African-controlled Namibia and Marxist Angola, the SWAPO guerrillas (Namibian nationalists trained and equipped by Cuban 'advisers' in Angola) moved across the Angolan border and resumed their programme of road mining, terrorism and kidnapping among the border tribes. They had blown up a few South African Defence Force trucks, and made off with a batch of 'recruits' from the local villages. The South Africans had decided to retaliate. A few Bushmen were sent across the border, or out from the base enclaves the South Africans had established within Angola. Using guile and bushcraft they discovered the latest locations of the main SWAPO camps and supply dumps, and then reported back. Now the South African mobile columns were prepared for the move into Angola to destroy them.

The South Africans maintained several mobile groups just over the border from Angola. One of these was the 61st Mechanized Battalion Group based at a remote camp at Omuthiya, and it was from this group that this Land Rover crew came. For several days they had been gradually moving forward through the bush, moving carefully by day and night, keeping well away from the few tracks that might have been mined, and well distanced from the few scattered settlements. The country is nearly all flat bush, with only a few gullies here and there, and the column, some 70 vehicles strong, simply barged its way through the scrubby landscape. The weather had been, as always in that area, hot and dry, but the column lacked nothing on its journey forward. All their supplies were carried either on the Ratels that made up the bulk of the vehicles or on the SAMIL 5-tonne trucks bringing up the rear. If anything urgent was required the South African Air Force brought it in by helicopter or dropped it from Transall C.160s.

The last few kilometres to the SWAPO camp were made as quietly as possible. The Land Rover acted as the trail-blazer and the signaller relayed information back to the group commander located in his special Command Ratel some distance back. This Ratel was really too large for the last push through the bush, so the 4×4 Land Rover was used instead. It provided a smaller potential target, and it was easier to conceal in the dark bush if anything went wrong. During this operation nothing went wrong, and in the early hours of the new day the Bushmen finally padded back with the information that the SWAPO camp was only 1000 metres (1,095 yards) ahead.

It was time for the Land Rover to stop. A final signal was made to the Command Ratel and the rest of the column started to deploy. As the Land Rover crew listened they could hear the Ratels moving up. On each side of them the Ratel 20s with their 20-mm cannon-armed turrets moved into position with the infantry crews pushing their rifles through the vehicle firing ports ready for action. To their rear the support Ratel 90s with their 90-mm (3.54-in) main guns moved into their predetermined position ready to add their firepower to any mêlée. The Command Ratel with its 12.7-mm (0.5-in) machine-gun was somewhere well forward, but it was impossible to see far into the bush in any direction, and away to the rear the arrival of the 81-mm (3.19-in) mortar crews with their armoured Buffel (buffalo) transport had to be sensed rather than heard or seen.

Dawn attack

As dawn broke the signal was given and the mortars opened fire. It was the indication for everyone to move forward, though the Land Rover stayed where it was. There was little it could contribute to the fight and the second-in-command might be needed if a withdrawal was required. As the Ratels moved on the SWAPO camp there was only limited welcoming fire. As always, the SWAPO guerrillas simply melted away into the bush in standard guerrilla style as the South Africans attacked. Their

Looming ghostlike through the dust of their passage, a convoy of Ratel APCs and Land Rovers move into the operational area. Travelling through the night, the column seeks to mount a dawn action, following the reports of Bushman scouts.

training dictates that they cannot last long in a stand-up fight; their role is to hit and run, and if a superior force is encountered it is better to run than remain. Thus as the Ratels broke into the camp perimeter very little resistance was met, and what there was was soon overwhelmed.

Thus when the Land Rover crew moved into the camp after about 15 minutes all was relatively peaceful. The Ratels and their crews were arranged in the bush around the base perimeter and their crews were well on the alert in case of a sudden counterattack. It did not come.

After a few restive hours it was time to look around, but the searching had to be carried out carefully for booby traps were everywhere. This was a usual SWAPO practice, so everyone was on their guard. As usual there were some casualties among the crowd of released Namibians who had been held in the base by their SWAPO captors following earlier raids. Some of these captives were children, some old men and women, but all had been subjected to SWAPO treatment, which was not gentle, and most were half-starved, for if they were unwilling to toe the SWAPO line they were simply not fed. Thus as the released crowd milled around they searched for food and inevitably set off some of the booby traps.

For a guerrilla group the SWAPO unit was certainly well equipped, with such unlikely items as Soviet-built T-34/85 tanks, BRDM-1 troop carriers and even some light artillery. Everywhere were dumps of ammunition, land mines and heaps of weapons of all kinds, far more than the SWAPO guerrillas would need for their immediate use. Once the booby traps had been cleared it was time to withdraw. This time the Land Rover carried boxes of RPG-7 anti-tank rocket launchers that would later be issued to the South Africans along the border posts. SAMIL trucks carried away the ammunition and weapons. As the Land Rover left, this time in the Ratel column, it led a small convoy of three captured UAZ-469B 4×4 light vehicles, very similar in concept to the Land Rover itself, and a single GAZ-69 light truck. They too were loaded with weapons and ammunition, and among their contents was a suitcase belonging to a Cuban captain. A BRDM-2 amphibious reconnaissance vehicle was earmarked to become a gate guardian back at the home base of the column at Omuthiya. It is still there today, and the Land Rover that was used in the silent approach to the SWAPO base is now used as a camp runabout, carrying nothing more aggressive than despatches to and from the various squadrons on the base.

Operation 'Protea' took place a long time ago now. After it there were many other 'flower' operations, but now they are all over. A pact has been reached between the South Africans, the Namibians and the Angolans. No longer will SWAPO be allowed to set up bases in Angola, and the South Africans have already withdrawn from their enclaves within Angola itself. So perhaps Omuthiya will once more settle down to being a small dusty village in the middle of nowhere, and the Land Rovers and the Ratels will depart to more peaceful operations elsewhere.

As dawn breaks, the sky lights to the tracers of a Ratel attack. In the struggle with SWAPO, surprise is essential for any success on either side, and in Operation 'Protea' the South African attack led to the capture of large amounts of booty.

FRANCE

Citroën Méhari Armée light vehicle

The **Citroën Méhari Armée** is typical of the many standard commercial vehicles that have been adopted to meet military requirements with a minimum of changes. In times of peace light vehicles, apart from the periods when they are on exercises, spend much of their time on normal roads and have little occasion to use their all-wheel drive. The 4×4 vehicles are not only expensive to procure, but also tend to be uneconomic on fuel.

After looking at a number of vehicles on the market the French army chose the Méhari to meet its requirements for a vehicle suitable for use in rear areas where little cross-country capability is required, and some 10,000 have now been delivered, not only to the French army, but also the *gendermarie*, air force and navy, with additional export sales being made. Typical roles include cargo carrying with a maximum load of 405 kg (894 lb), and command when fitted with radios. The type is not used to mount any type of weapon system.

The civilian model is produced in such exotic colours as TP orange and beige, but the military vehicles are in various shades of sand or green. The Mehari Armée has an all-steel chassis with a plastic body. This requires hardly any maintenance as it will not rust. The basic model has the engine at the front, seats for the driver and one passenger in the centre (each with a safety door chain), and an additional two-man seat that folds down at the rear to provide a large cargo area. The windscreen folds forwards onto the bonnet and a black cotton canopy can be fitted over the body; if required, a complete hood with transparent side panels and doors can be installed. The utility model is similar, but to the rear of the driver and passenger seat is a flat load area. Like the basic model it has a windscreen and canopy, and can be fitted with a complete hood.

The engine is coupled to a manual gearbox with four forward and one reverse gear, there being no transfer box as it is only a 4×2 vehicle. Both the front and rear axles are suspended by arms with lateral interplay on spiral springs, with hydraulic shock absorbers at each wheel station. Even though this is only a 4×2 vehicle the Méhari Armée does have some cross-country capability, and it is so light that it can be easily manhandled in the field.

The Citroën company has more recently developed another light vehicle that is available in both 4×4 and 4×2 configurations. This is the **A FAF** and has a maximum payload of 400 kg (882 lb). It is powered by a petrol engine developing 28.5 hp (21 kW) in the 4×2 configuration, or 34 hp (25.3 kW) in the 4×4 configuration. Both versions use automotive components from the civilian A type 4×2 vehicle, of which many millions have been built. The 4×4 model was selected by Burundi and in 1981 by the French army which placed an order for 5,000 vehicles, while the 4×2 model is produced under licence in Greece by the National Motor Company (NAMCO) as the **Pony**, which is used by the Greek army in a number of roles.

Specification

Citroën Méhari Armée

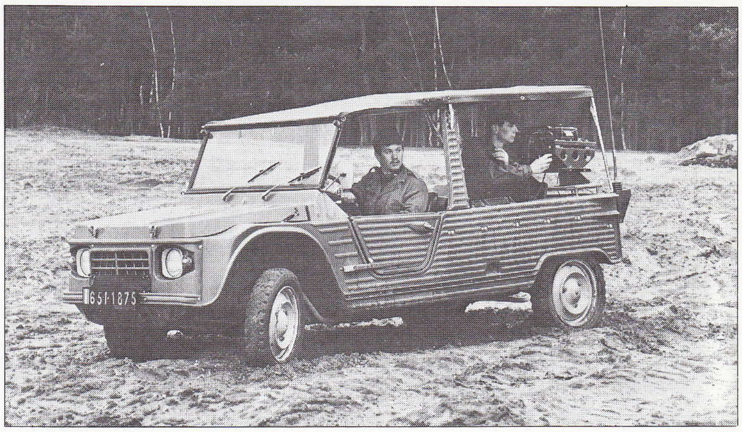
Crew: 1+1

Weight: empty 585 kg (1,290 lb) and loaded 990 kg (2,183 lb)

Powerplant: one AK 2 2-cylinder air-cooled petrol engine developing 26 hp (19.4 kW)

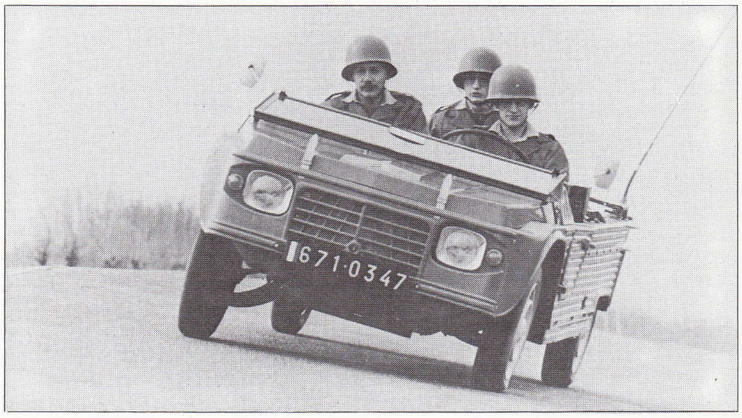
Dimensions: length 3.52 m (11 ft 7 in); width 1.53 m (5 ft 0 in); height 1.635 m (5 ft 4 in)

Performance: maximum road speed 100 km/h (62 mph); maximum range 300 km (186 miles); gradient 40 per cent; fording 0.30 m (1 ft 0 in)



Above: A Citroën Méhari Armée (4×2) light vehicle, used in the command role with a radio fitted in the rear of the vehicle. This vehicle was originally developed for the civilian market, but was then found to be suitable for a wide range of rear area duties where all-wheel drive is not essential.

Below: A basic Citroën Méhari Armée (4×2) light vehicle, with the hood folded down at the rear. An unusual feature of this vehicle is that its body is of all-plastic construction, which is rust free and therefore requires little or no maintenance. The vehicle is used by all three arms of the French forces.



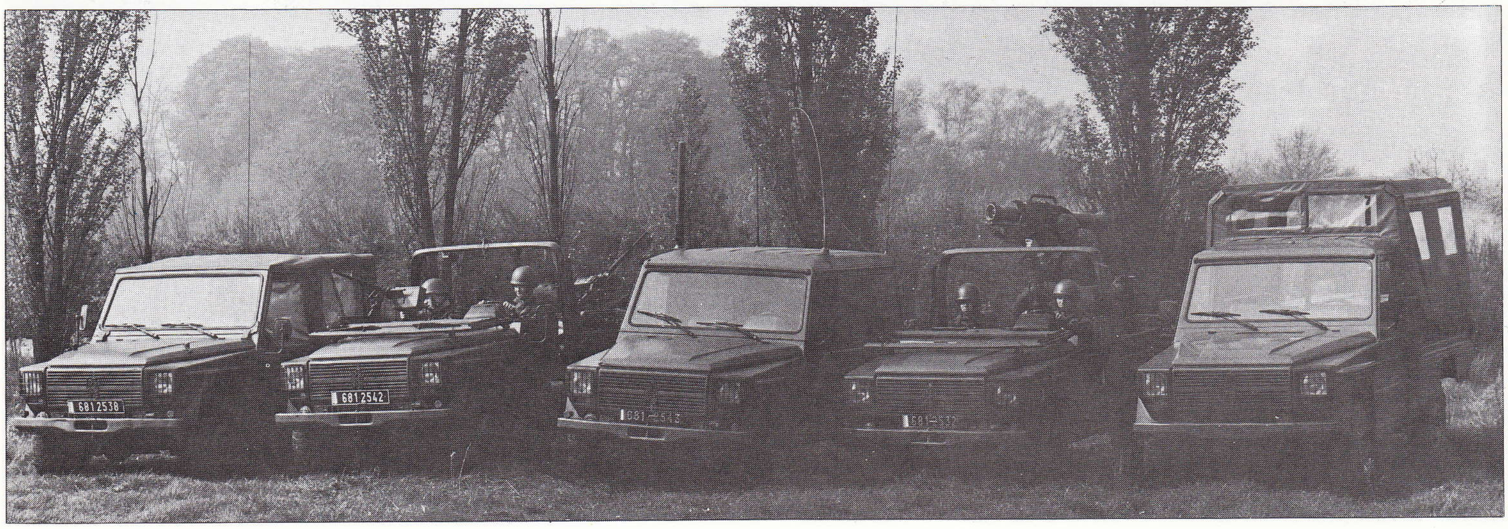
FRANCE

Peugeot P4 light vehicle

Since the 1950s the standard light vehicle of the French army has been the Hotchkiss M 201, and to find a replacement for this type the French army held a competition for which three manufacturers each provided four vehicles. Each of the three French manufacturers selected foreign vehicles, Peugeot selecting a Mercedes-Benz vehicle, Renault the Italian FIAT 1107 AD which it renamed the TRM 500, and Citroën the West German Volkswagen Iltis (already in service with the West German army) which it renamed the C 44. In 1981 the **Peugeot P4** was selected, and the first of 15,000 vehicles were delivered in the following year.

In the basic model the engine is at the front, the driver and one passenger in the centre, and the cargo area at the rear. The last has a two-man bench seat down each side, and this can be folded down to provide more space;

Five variants of the Peugeot P4 range of vehicles are (left to right) short wheelbase; short wheelbase with 7.62-mm (0.3-in) machine-gun; long wheelbase command vehicle; short wheelbase with MILAN ATGW; and long wheelbase troop carrier. The French army has ordered only the short wheelbase version.



the opening tailgate also carries the spare tyre. The engine is coupled to a manual gearbox with four forward and one reverse gear and a two-speed transfer box is fitted. The suspension front and rear consists of coil springs and double-action shock absorbers. The basic model is powered by the XN8 four-cylinder inline petrol engine, but the P4 is also offered with the XD3 four-cylinder diesel which develops 75 hp (56 kW) and gives a much better fuel consumption when being driven at a speed of 60 km/h (37 mph), though at 90 km/h (56 mph) fuel consumption is identical with that of the petrol engine. Standard equipment includes inertia seat belts, towing eyes at the front, a trailer hook at the rear and a 24-volt electrical system. Optional equipment includes a 15-litre (3.3 Imp gal) fuel can, power take-off front and rear, power-assisted steering, front locking differential and a front-mounted winch. Winches are available on most light vehicles as an optional extra and can be used for self recovery or for recovering other vehicles. In the former case the end of the cable is attached to a tree or other solid object and the vehicle winches itself out of trouble.

In French army service some vehicles will be fitted with twin light machine-guns for use in the reconnaissance role, while others will be used to carry MILAN anti-tank teams around the battlefield, each team having one launcher and four missiles. There is also a long-wheelbase version, which has not been adopted by the French army so far; this can carry 10 men (two in the front as normal and a further eight in the rear seated four down each side). Fully enclosed versions of both the standard- and long-wheelbase versions are available for use in the command and ambulance roles.

Peugeot has also built a 4×4 version of the standard civilian **Peugeot 504** pick-up truck, and some of these have recently been ordered by the French marines as it has a useful payload of 1110 kg (2,448 lb), good ground-clearance and a high road speed. In addition to the basic pick-up model, station wagon and ambulance versions are also offered.

Specification
Peugeot P4
Crew: 1+1 (plus 4 in rear)
Weight: empty 1680 kg (3,704 lb) and loaded 2280 kg (5,026 lb)
Powerplant: one XN8 4-cylinder petrol engine developing 83.5 hp (62 kW)
Dimensions: length 4.12 m (13 ft 6 in); width 1.70 m (5 ft 7 in); height 1.95 m (6 ft 5 in)
Performance: maximum road speed 122 km/h (76 mph); maximum range 500 km (311 miles); gradient 70 per cent; fording 0.60 m (2 ft 0 in)

FRANCE

Hotchkiss M 201 light vehicle

The Free French Forces used the American-supplied Jeep in large numbers during World War II, and these proved so successful that in the early 1950s Hotchkiss-Brandt of Paris obtained a licence to start production in France, for both the civilian and military markets. The first production models of this **Hotchkiss M 201** were completed in 1953 and production continued until 1969, by which time over 40,000 had been built. In addition to being used by the French armed forces the M 201 was supplied to many countries in North Africa and also to Belgium. In the French armed forces its replacement by the Peugeot P4 (4×4) vehicle, which has greater load-carrying capability, has recently started. The M 201 will be around for many years yet, however, and surplus vehicles are already finding their way onto the civilian market.

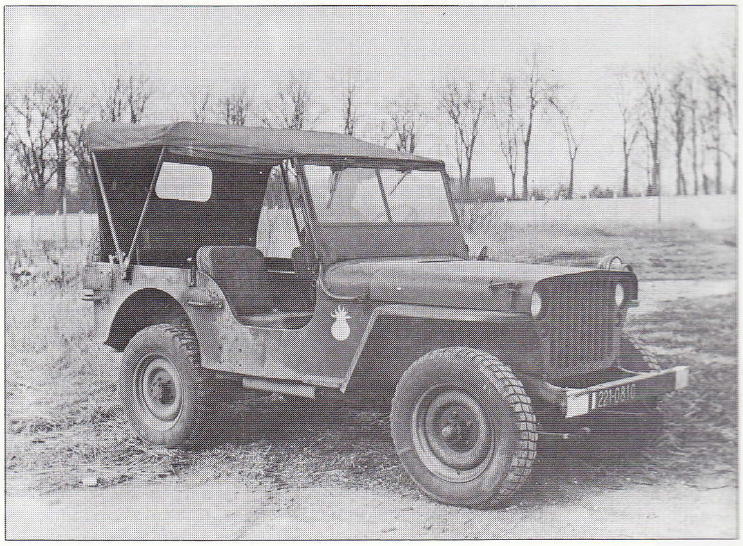
The M 201 is almost identical to the wartime Jeep with the engine at the front, driver and one passenger in the centre, and a seat for a further two passengers at the rear. With the windscreen erected a canopy can be fitted to the M 201 to provide protection for the crew. The engine is coupled to a manual gearbox with three forward and one reverse gear and a two-speed transfer box. Suspension consists of semi-elliptical springs and hydraulic shock absorbers. The vehicle can carry a maximum load of 400 kg (882 lb) and tow a trailer weighing up to 500 kg (1,102 lb).

The M 201 has been used as a weapons carrier and fitted with 7.62-mm (0.3-in) or 12.7-mm (0.5-in) machine-guns, 106-mm (4.17-in) M40 type recoilless rifles (which can also be dismounted for use in the ground role) and ENTAC ATGWs. In the last model a total of four missiles were carried in the ready-to-launch position, a further three missiles being carried in reserve; this model was used by France and Belgium, but the missiles have now been replaced by the longer-range Euromissile MILAN system. The vehicle is also fitted with extensive communications equipment for use in the command role, and some have even been fitted with battlefield surveillance radars to detect enemy movements some distance away.

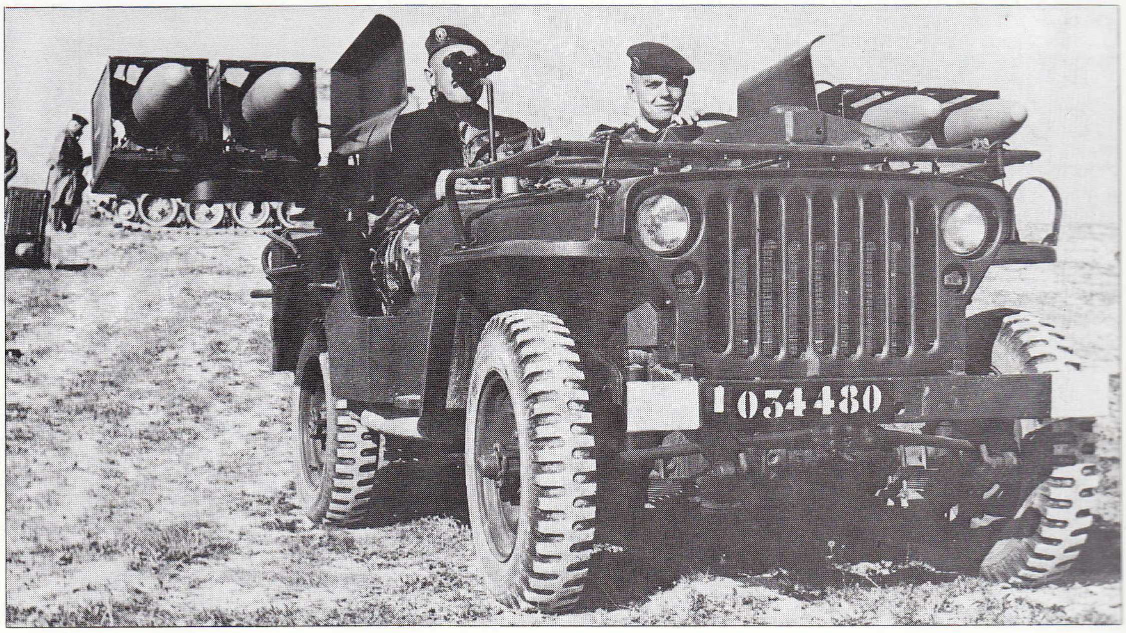
The basic military model has a wheelbase of 2.03 m (6 ft 8 in), but a longer model was built with a wheelbase of 2.53 m (8 ft 4 in) and greater carrying capability.

Once the M 201 had gone out of production, a number of manufacturers proposed vehicles to fill this gap: at the time there was no French army requirement for a new vehicle, but new countries that were previously French colonies or who had a strong French bias still looked to France for their requirements. This gap was eventually filled by the **SAMO** light vehicle, which is available in both standard- and long-wheelbase configurations, with a petrol or diesel engine, and with a wide range of optional equipment such as heavy-duty axles, 24-volt electrical system, long-range fuel tanks and a winch. This has been exported to a number of countries including the Central African Republic, Chad, Upper Volta and Burundi.

Specification
Hotchkiss M 201
Crew: 1+1 (plus 2 in rear)
Weight: empty 1120 kg (2,469 lb) and loaded 1520 kg (3,351 lb)
Powerplant: one 4-cylinder petrol engine developing 61 hp (46 kW)
Dimensions: length 3.36 m (11 ft 0 in); width 1.58 m (5 ft 2 in); height 1.77 m (5 ft 10 in)
Performance: maximum road speed 100 km/h (62 mph); maximum range 348 km (216 miles); gradient 65 per cent; fording 0.533 m (1 ft 9 in)



Above: The M 201 (4×4) light vehicle was in production by Hotchkiss-Brandt in Paris from 1953 to 1969 for both the civilian and military markets. It is almost identical to the Jeep used by the Allied armies during World War II, and it is only now being replaced in the French army by the Peugeot P4 (4×4) light vehicle, which is based on a West German design.



Right: A Hotchkiss M 201 (4×4) light vehicle of the French army fitted with four Aérospatiale ENTAC wire guided anti-tank missiles. For travelling, these missiles are retracted to the rear of the driver and missile operator. In the French army ENTAC has now been replaced by the MILAN ATGW.

AUSTRIA

Steyr-Puch 700 AP Haflinger light vehicle

The **Steyr-Puch 700 AP Haflinger** light vehicle was designed in the early 1950s specifically for use in mountainous terrain, and was in production between 1959 and 1974, by which time the Pinzgauer was firmly established as its successor with its much improved cross-country performance and increased load-carrying capability. The Haflinger has an unusual layout, with the driver at the very front on the left, with one passenger to his right and a further two passengers to the rear. At the rear is a very small cargo-carrying area, which can be increased by folding flat the back two seats. When the vehicle is being used in the troop-carrying role the windscreen is normally erected and a canvas top with removable side doors is fitted.

The engine is mounted under the very rear of the hull which has enabled the load-carrying area to be retained, but it has also meant that the fording capability of the vehicle is limited. The engine is coupled to a manual gearbox (with four forward and one reverse gears) which transmits power to all four wheels, which have 165×12 tyres. Vehicles produced after 1967 have a manual gearbox with five forward and one reverse gear, a significant improvement over the earlier model as no transfer box is fitted. From 1967 the vehicle was produced with a slightly more powerful engine. Optional equipment included a winch with a capacity of 1500 kg (3,307 lb), a power take-off for running accessories such as a power saw, and a snow plough. There was also a model of the Haflinger with a slightly longer wheelbase and slightly greater load-carrying capability.

In its military role, the Haflinger was often used as a weapons platform. The Austrian army has used the vehicle to mount the standard 12.7-mm (0.5-in) M2 HB machine-gun on a pintle in the centre of the vehicle, or the old American 57-mm (2.24-in) M18A1 recoilless anti-tank rifle. Both the Swiss and Swedish armies have used the vehicle as an anti-tank platform with six Bofors Bantam wire-guided anti-tank missiles facing the front and another eight missiles facing the rear.

Specification

Steyr-Puch Haflinger

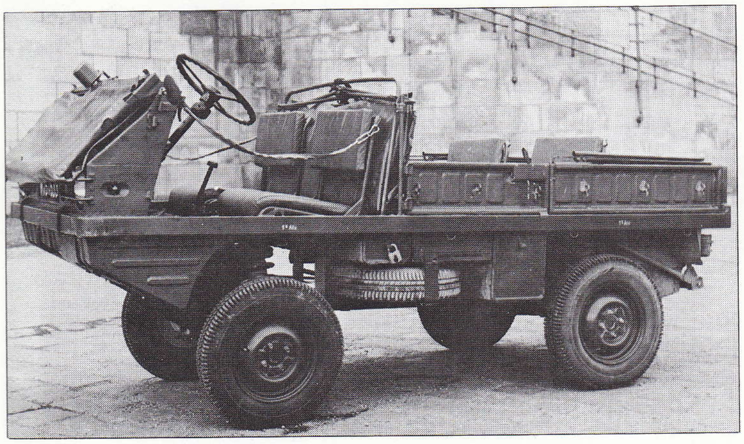
Crew: 1+3

Weight: empty 645 kg (1,422 lb) and loaded 1200 kg (2,645 lb)

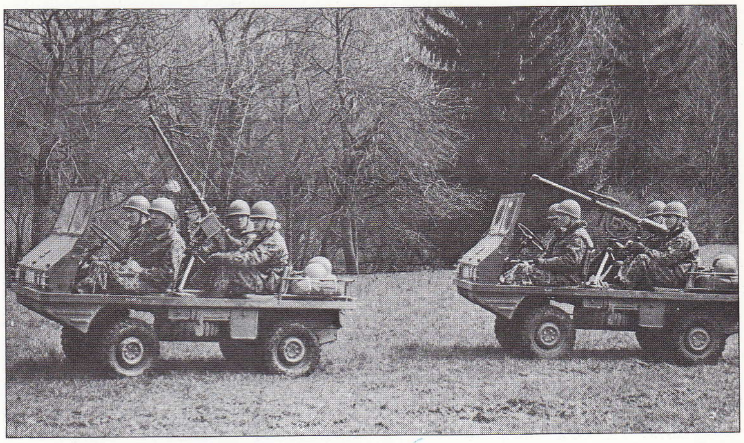
Powerplant: one Model 700 AP 2-cylinder petrol engine developing 24 hp (18 kW)

Dimensions: length 2.85 m (9 ft 4 in); width 1.40 m (4 ft 7 in); height 1.74 m (5 ft 8 in)

Performance: maximum road speed 75 km/h (46.6 mph); maximum range 400 km (248 miles); gradient 65 per cent; fording 0.40 m (1 ft 4 in)



A Steyr-Puch Haflinger (4×4) light vehicle with a canvas top and the side removed to show the seating arrangements. The two-cylinder petrol engine is under the rear and is coupled to a manual gearbox with four forward and one reverse gear.



Two Haflinger (4×4) light vehicles of the Austrian army. The one on the left is armed with a 12.7-mm (0.5-in) M2 HB machine-gun, and that on the right with a 57-mm recoilless rifle for use in the anti-tank role. This vehicle was in production between 1959 and 1974.

WEST GERMANY

Mercedes-Benz light vehicle

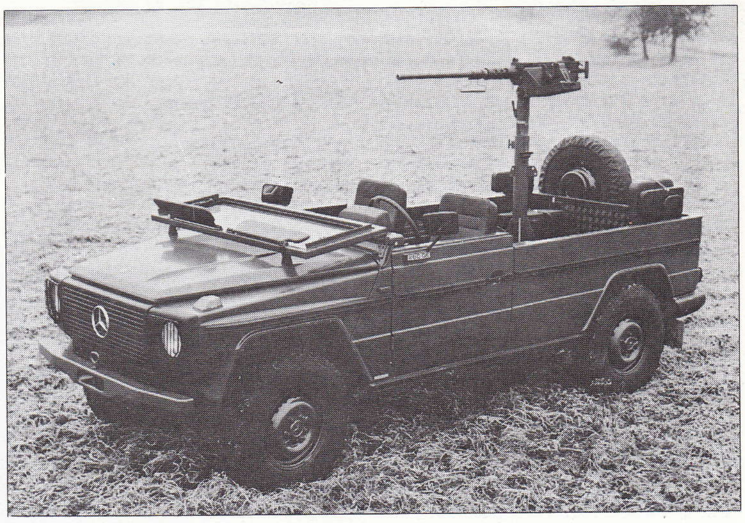
The Mercedes-Benz company of West Germany has for many years produced a wide range of trucks that are widely used by the military, including the famous Unimog range which is available in models with cross-country payloads of between 1 and 5 tonnes. To complement these vehicles it was decided to design a new **Mercedes-Benz light vehicle** which would have a cross-country payload of 750 kg (1,654 kg) and be able to tow a 2500-kg (5,511-lb) trailer on roads or a 750-kg (1,654-lb) trailer across country. This vehicle was not adopted by the West German army, which selected the West German Volkswagen Iltis. The vehicle was entered by Peugeot in the competition for a successor to the Hotchkiss M 201 light vehicle used by the French army, winning the competition in the form of the Peugeot P4 which is now in service with the French army in a number of variants.

Production of this vehicle is undertaken in Austria by GFG, which built 7,500 vehicles in 1980, mostly for the civilian market. GFG was established by Daimler-Benz and Steyr-Daimler-Puch, the former company supplying the axles, transmission and engine and the latter the body and chassis. This vehicle has been adopted by the Norwegian army, which ordered an initial batch of 450, and some were obtained by Argentina, only to be captured by the British in the Falklands. These captured vehicles are now used by the British forces alongside their Land Rovers, spare parts being obtained from normal commercial sources in Europe!

The layout of the vehicle is different to that of the Land Rover with the engine at the front, driver and one passenger in the centre, a seat for two passengers to the rear and a small cargo area at the back. The rear seats can be folded down to provide space for cargo, which can be loaded through a door in the rear, although the short-wheelbase vehicle has a drop-down rear like the Land Rover. The basic model is available with four different engine options, a four- or five-cylinder diesel or a four- or six-cylinder petrol engine, the latter two offering the highest performance. The engine is coupled to a manual gearbox with four forward and one reverse gear and a transfer-box; for road operations the vehicle is normally driven in 4×2 configuration.

In addition to the normal four-seater version, there is also a station wagon type with a fully enclosed body and twin doors at the rear, and a long-wheelbase model with a van type body; although these are aimed mainly at the civilian market, the van type model has obvious potential for use as a command vehicle or ambulance.

As with most vehicles today a range of optional equipment can be fitted including an electrically-operated winch mounted at the front, different tyres, front and rear differential locks, a trailer coupling, a tow hook on the front, a trailer hook at the rear and additional protection for the radiator and engine.



A Mercedes-Benz (4×4) light vehicle with the windscreen folded forwards and the hood removed to allow installation of a pintle-mounted 12.7-mm (0.5-in) M2 HB machine-gun in the rear. Light vehicles with similar armament installations are used by almost every country in the world for reconnaissance.

Specification

Mercedes-Benz light vehicle

Crew: 1+1 (plus 2 in rear)

Weight: empty 1670 kg (3,682 lb) and loaded 2400 kg (5,291 lb)

Powerplant: one OM616 4-cylinder diesel developing 65 hp (49 kW)

Dimensions: length 4.145 m (13 ft 6 in); width 1.70 m (5 ft 7 in); height 1.995 m (6 ft 7 in)

Performance: maximum road speed 117 km/h (72 mph); gradient 80 per cent; fording 0.60 m (2 ft 0 in)

WEST GERMANY

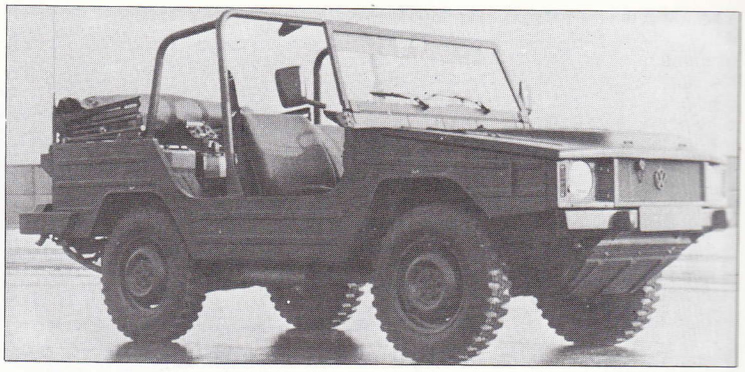
Volkswagen Iltis light vehicle

The standard light vehicle of the West German armed forces for many years was the **Auto-Union Lkw** (4×4), which could carry 250 kg (552 lb) of cargo. Between 1958 and 1968 over 55,000 of these were built at Ingolstadt for both civil and military use. The Lkw was to have been replaced by the so called Europe Jeep designed to carry 500 kg (1,102 lb) of cargo and also have an amphibious capability, but after prototypes had been built by two competing teams (each having one manufacturer from West Germany, Italy and France), the whole project was dropped. The West German army then issued a new requirement for a vehicle that would carry 500 kg (1,102 lb) of cargo across country, but which was not required to be amphibious. To meet this requirement prototype vehicles were built by Daimler-Benz and Volkswagen, and in 1977 the latter type was selected and an order placed for 8,800 **Volkswagen Iltis** vehicles. The first of these were handed over in 1978, and production has now been completed for the West German armed forces. The Iltis was entered in the French army competition for a new light vehicle by Citroën under the designation **Citroën C 44,** but this competition was eventually won by Peugeot P4 based on a West German Mercedes-Benz design. More recently the Iltis has been selected by the Canadian Armed Forces to replace its obsolete M38 vehicles which have been in service for some 30 years, and production will be undertaken in Canada by Bombardier Incorporated.

The Iltis has a pressed steel body with the engine at the front, driver and one passenger in the centre, and cargo area at the rear. The last has a seat which can be folded down to increase the load area. In inclement weather the windscreen is raised and the folding hood and removable sidescreens fitted. The engine is coupled to a manual gearbox with five forward and one reverse gear and a two-speed transfer box. When driving on roads the front axle is normally disengaged so the vehicle becomes a 4×2. Suspension front and rear consists of semi-elliptical leaf springs and double-acting hydraulic shock absorbers.

The basic vehicle is used for normal duties in the front-line area, but more specialized versions include a cable-layer for use by signal units, a command vehicle with communications equipment, an artillery survey vehicle, an ambulance and an anti-tank vehicle with Euromissile MILAN ATGWs. This last model is the replacement for the Lkw with Cobra ATGWs that were launched over the rear of the vehicle.

The West German Army also uses a number of **Volkswagen 181** (4×2) light vehicles for general duties where a 4×4 capability is not essential, and numbers of these vehicles were supplied to Austria, Denmark and France for military use.



A Volkswagen Iltis (4×4) vehicle with the hood folded down at the rear. This is now the standard vehicle in its class in the West German armed forces, and is now being manufactured under licence in Canada by Bombardier Incorporated.

Specification

Volkswagen Iltis

Crew: 1+1 (plus 2 in rear)

Weight: empty 1550 kg (3,417 lb) and loaded 2050 kg (4,520 lb)

Powerplant: one 4-cylinder petrol engine developing 75 hp (56 kW)

Dimensions: length 3,887 m (12 ft 9 in); width 1.52 m (5 ft 0 in); height 1.857 m (6 ft 1 in)

Performance: maximum road speed 130 km/h (80 mph); maximum range 500 km (311 miles); gradient 70 per cent; fording 0.60 m (2 ft 0 in)

USSR

UAZ-469B light vehicle

In 1960 the Ul'yanovsk Motor Vehicle Plant, which was then building the UAZ-69 and UAZ-69A (4×4) light vehicles, built the prototype of a new vehicle called the **UAZ-469**, which used many components of the **UAZ-450** range of 4×4 forward control vehicles designed mainly for civilian use. This was not placed in production and further development resulted in the **UAZ-469B** which entered production in 1972 and has now replaced almost all of the UAZ-69 and UAZ-69A light vehicles in the armies of the USSR and of most other members of the Warsaw Pact. The UAZ-469B uses the engine, transmission, axles, brakes and other parts of the **UAZ-452** series of 4×4 light vehicles, which are used in both civilian and military roles. The vehicle has been widely exported outside the Soviet Union, especially to the Middle East, and is available on the civilian market as the **Tundra**.

The main improvements of the UAZ-469B over the earlier vehicle include slightly increased payload, greater road speed and much longer operational range.

The layout of the UAZ-469B is conventional, with the engine at the front and the driver and passenger in the centre (each with a side door); to their rear is a three-man bench seat with a door on each side, and a further two men can sit at the rear, one on each side, facing each other. The windscreen can be folded forward onto the bonnet, the tops of the doors removed and the canvas top folded down. When carrying seven men the freight payload of the vehicle is only 100 kg (220 lb), but when only the driver and one passenger are carried this payload is increased to 600 kg (1,323 lb). The vehicle can also tow an unbraked trailer weighing a total of 600 kg (1,323 lb), or 2000 kg (4,409 lb) if braked.

The four-cylinder petrol engine is coupled to a manual gearbox with four forward and one reverse gear and a two-speed transfer case. The suspension consists of semi-elliptical springs and hydraulic shock absorbers; 8.40×15 tyres are fitted all round, and a spare wheel and tyre are located on the rear.

In addition to the basic model, which is widely used by the Soviet army, there is also an ambulance model designated the **UAZ-469G** which can carry four stretcher patients in addition to the driver, a fully enclosed van-type vehicle used for a variety of roles, and another that has equipment fitted at the rear of the hull that dispenses pennants into the ground to designate clear lanes through NBC-contaminated areas.

Although the UAZ-469B is the most widely used light vehicle, it is not the only one of its type in the Soviet Union. The **VAZ-2121** (4×4) light vehicle has been used for a number of military applications and is sold in the West as the **Niva**. The Lutsk Motor Vehicle Plant has developed the **LuAZ-967M** amphibious battlefield medical reconnaissance vehicle as well as the **LuAZ-969** (4×4) light vehicle which is used mainly for civilian applications, although its automotive components are used in the LuAZ-967M.

In general terms, Soviet trucks and light vehicles have not proved so popular in the Middle East and elsewhere as their Western counterparts have, as the latter are found to be more reliable.

Specification

UAZ-469B

Crew: 1+1 (plus 7 in rear)

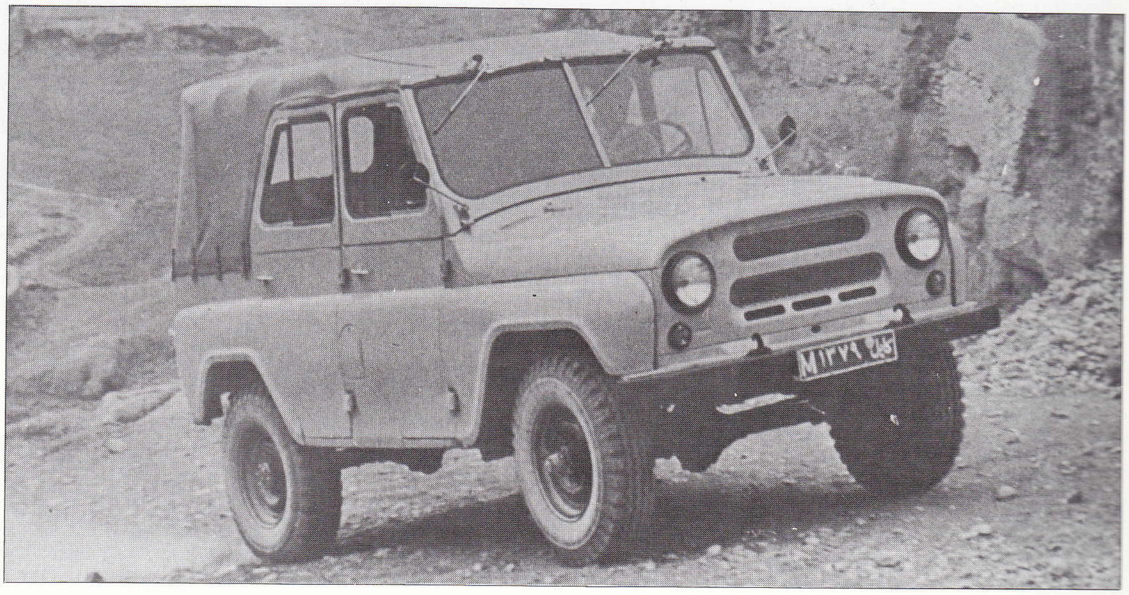
Weight: empty 2290 kg (5,048 lb) and loaded 1540 kg (3,395 lb)

Powerplant: one ZMZ-4151M 4-cylinder water-cooled petrol engine developing 75 hp (56 kW)

Dimensions: length 4.025 m (13 ft 2 in); width 1.785 m (5 ft 10 in); height 2.015 m (6 ft 7 in)

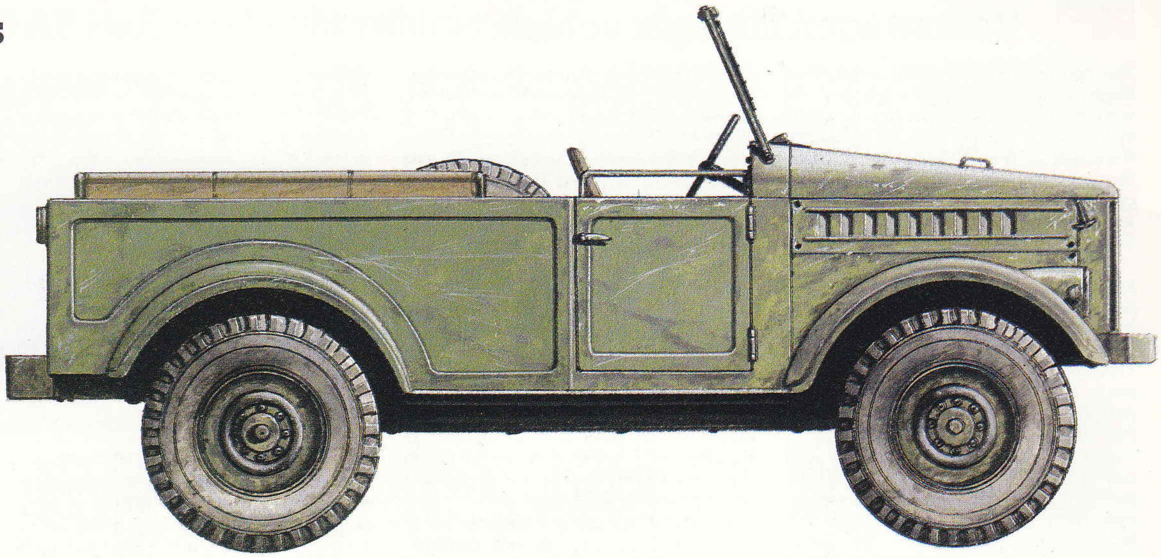
Performance: maximum road speed 100 km/h (62 mph); maximum range 750 km (466 miles); gradient 62 per cent; fording 0.80 m (2 ft 8 in)

A UAZ-469B (4×4) light vehicle, which entered production at the Ul'yanovsk Plant in 1972. It is used by every arm of the Soviet forces and has been exported on a large scale.



USSR

GAZ-69 series



A GAZ-69 (4×4) light vehicle, which has seats for the driver and one passenger at the front and a bench seat down each side at the rear. The windscreen is in the raised position but the cover is not erected. On the left side of the vehicle is the spare wheel and tyre.

The **GAZ-69** series is the Soviet equivalent of the Jeep, and entered production at the Gor'ky Motor Vehicle Plant in 1952, although in 1956 production was transferred to the Ul'yanovsk Motor Vehicle Plant and the vehicle was subsequently redesignated **UAZ-69**. Production continued well into the 1960s, the type's replacement, the UAZX-469B, entering production in 1972.

The basic GAZ-69 has a conventional layout with the engine at the front, the driver and one passenger in the centre, and the cargo at the rear. The last has a bench seat down each side. The windscreen can be folded forward onto the bonnet, and the crew and cargo/passenger area can be covered by a quickly-removable cover that is stowed at the rear when not in use. The GAZ-69 can carry a maximum load of 500 kg (1,102 lb) and tow a trailer weighing a maximum of 850 kg (1,874 lb).

The M-20 petrol engine is coupled to a manual gearbox with three forward and one reverse gear, a two-speed transfer box being standard. Suspension front and rear consists of semi-elliptical springs with hydraulic shock absorbers. Late production vehicles were of the **UAZ-69M** standard with a more powerful engine.

The **GAZ-69A** (later **UAZ-69A**) has four doors, two on each side, and can carry five men and 100 kg (220 lb) of cargo.

As with most vehicles of this type the chassis has been used for a number of applications. The GAZ-69 anti-tank vehicle has been rebuilt to the rear of the driver/passenger area and carries four AT-1 'Snapper' wire-guided anti-tank missiles, which are launched to the rear of the vehicle with the operator either a short distance away from the vehicle (controlling the missiles with a separation sight and controller) or from within the cab (a window in the right side being provided for this purpose). This particular vehicle has seen combat in the Middle East.

The chassis was also used as the basis for the **GAZ-46** or **MAV** amphibious vehicle, which is similar in concept to the American Ford GPA (4×4) vehicle supplied to the Soviet Union during World War II and based on a Jeep chassis. The GAZ-46 was used to carry out reconnaissance of river crossing points, but this role has now been taken over by amphibious armoured vehicles such as the BRDM-1 and BRDM-2.

One of the more unusual models is that fitted with DIM mine-detection equipment. When travelling this equipment rests on the roof of the vehicle, but when required for use is swung through about 140° to project over the front of the vehicle, where it is supported by two small rubber tyres. The vehicle is driven along the road at low speed, and when the sensor detects a mine or other metallic object the vehicle automatically stops and an alarm sounds. Once the exact position of the mine has been determined its position is marked and the vehicle withdrawn to the rear while it is neutralized.

Specification

GAZ-69

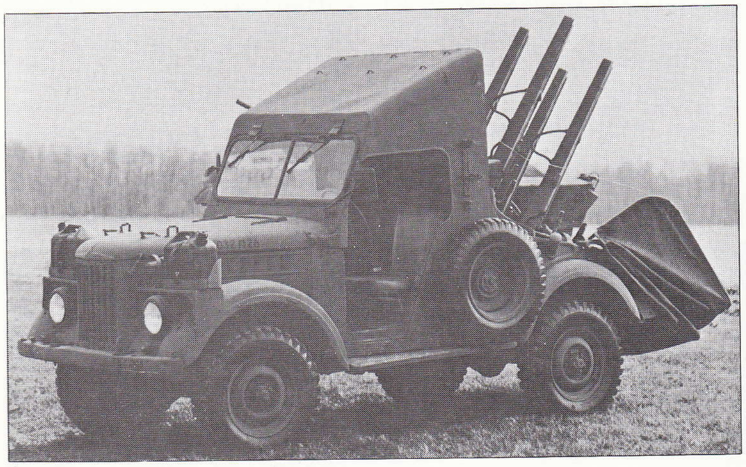
Crew: 1+1 (plus 4 in rear)

Weight: empty 2175 kg (4,795 lb) and loaded 1525 kg (3,362 lb)

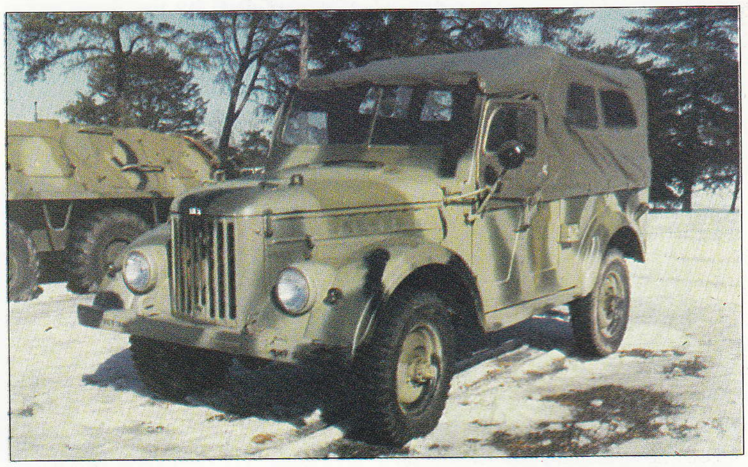
Powerplant: one M-20 4-cylinder petrol engine developing 52 hp (39 kW)

Dimensions: length 3.85 m (12 ft 8 in); width 1.85 m (5 ft 2 in); height 2.03 m (6 ft 8 in)

Performance: maximum road speed 90 km/h (56 mph); maximum range 530 km (330 miles); gradient 60 per cent; fording 0.55 m (1 ft 10 in)



A GAZ-69 (4×4) light vehicle, used in the anti-tank role with a four-round launcher for Snapper ATGWs at the rear. In this photograph the wire-guided ATGWs are not fitted. The launcher is covered when travelling.



A GAZ-69 (4×4) light vehicle with the top in the raised position. This entered service with the Soviet armed forces in 1952, but has now been replaced in most units by the UAZ-469B, which has a slightly greater payload.

ITALY

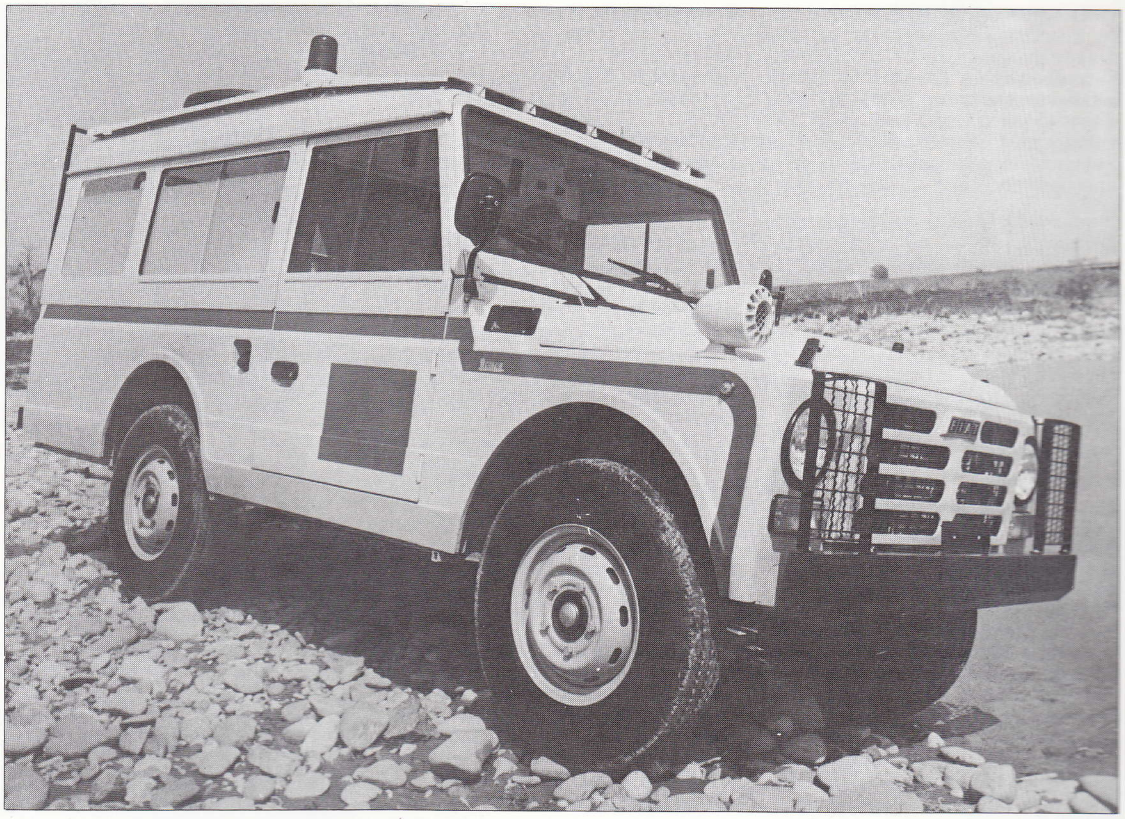
Fiat 1107 AD light vehicle

When the Italian army was re-formed its requirement for a light vehicle was met by the **Fiat AR-51** which was powered by a four-cylinder petrol engine developing 53 hp (39.5 kW); this was succeeded in production by the **AR-55** and finally by the **AR-59**. All these vehicles have a similar layout with the engine at the front, driver and one passenger in the centre, and cargo area at the rear, the last having a bench seat down each side for two men. An interesting feature of these vehicles was that the side doors could be swung back through 180° and clipped to the sides so allowing the crew to leave the vehicle rapidly in an emergency.

The AR-59 was replaced in production by the **Fiat 1107 AD** (4×4) light vehicle which has a maximum payload of 750 kg (1,653 lb) across country and can tow a 1740-kg (3,836-lb) trailer on roads or a 900-kg (1,984-lb) trailer across country.

The Fiat 1107 AD entered production in 1974 for both the civilian and military markets. It is also produced under licence in Yugoslavia for the army (as was the earlier AR-59 under the name of the **Zastava**) and was entered in the French army's competition for a new light vehicle by Renault under the designation **Renault TRM 500**, although this competition was won by Peugeot.

The body of the Fiat 1107 AD is of all-steel construction, with the engine at the front, driver and two passengers in the centre (with a door on each side opening to the front) and the cargo area at the rear. The last has a bench seat down each side for two men, and can be loaded via the tailgate, on



The Fiat 1107 AD (4×4) chassis is used for a number of applications, such as this forward ambulance with bodywork by Grazia. In addition to the military, civilian authorities such as ambulance and fire brigades use the military-type chassis where an off-road capability is required.

which the spare wheel is carried. The basic model has a windscreen that folds forward onto the bonnet and a removable canvas top and side curtains. The Fiat 1107 AD is also produced with a fully enclosed hard-top body and there is also a long-wheelbase version that can carry a total of nine men.

The petrol engine is coupled to a manual gearbox with five forward and one reverse gear and a two-speed transfer box. Suspension is of the independent McPherson type with longitudinal torsion bar. Each front wheel station has a single hydraulic shock absorber while each rear wheel station has two hydraulic shock absorbers, because the loaded vehicle has more weight on the back of the vehicle than the front.

More recently the company has offered the type with a diesel engine for longer operational range. Standard equipment for the military model includes a pintle towing hook at the rear to enable trailers and light weapons to be towed, towing eyes at the front, pick and shovel, a fire-extinguishing system, and a heating and defrosting system; options include a petrol engine that will run on low-octane fuel and special equipment such as engine protection and a fuel filter between pump and carburettor.

The vehicle can be adapted as a communications vehicle or ambulance, and a number of companies in Italy have made use of the chassis for other applications, one such being ASA for the **Guardian** internal security vehicle, which was used in small numbers by the Italian peacekeeping force in Lebanon early in 1984.

Specification

Fiat 1107 AD

Crew: 1+2 (plus 4 in rear)

Weight: empty 2420 kg (5,335 lb) and loaded 1670 kg (3,682 lb)

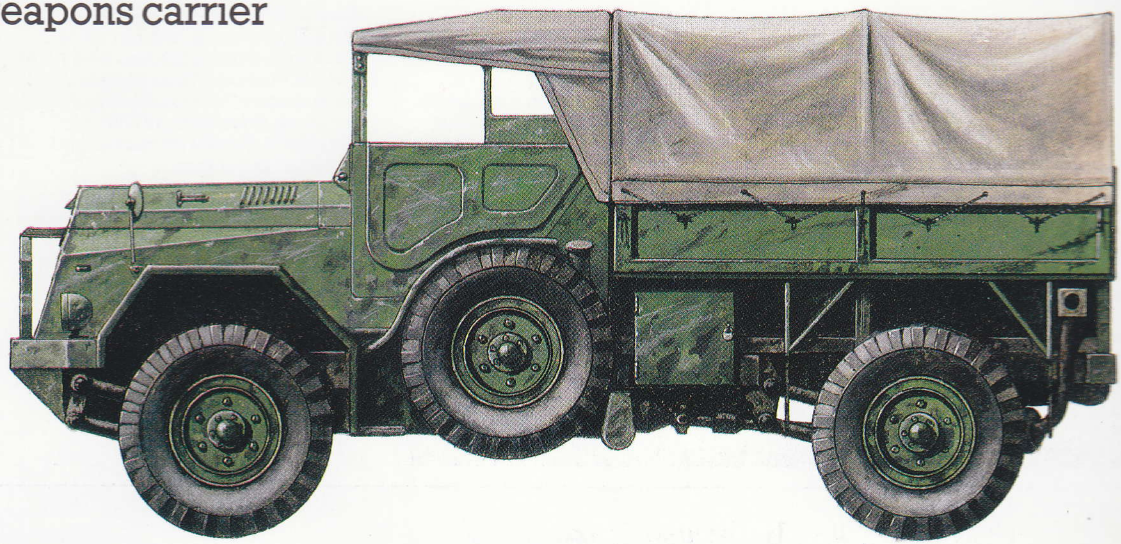
Powerplant: one 4-cylinder petrol engine developing 80 hp (59.7 kW)

Dimensions: length 3.775 m (12 ft 5 in); width 1.58 m (5 ft 1 in); height 1.901 m (6 ft 3 in)

Performance: maximum road speed 120 km/h (74.5 mph); maximum range 400 km (249 miles); gradient 100 per cent; fording 0.70 m (2 ft 3 in)

THE NETHERLANDS

DAF YA 126 weapons carrier



A DAF YA 126 (4×4) weapons carrier, with bows and a tarpaulin cover erected over the troop compartment at the rear. To assist with self-recovery and to recover other vehicles that became stuck, a number of Dutch army YA 126 vehicles were fitted with a winch.

Since well before World War II Van Doorne's Automobielfabriek of Eindhoven has been a major supplier of wheeled transport vehicles to the Dutch army. In the immediate post-war period the company, which today is known as DAF Trucks, produced a complete range of new transport vehicles for the Dutch army, the smallest member of this family being the **DAF YA 126** (4×4) weapon carrier. The prototype of this was completed in 1950, and production was undertaken at Eindhoven between 1952 and 1960. The type is still in service, but has been replaced in many units by DAF trucks with an increased payload.

The layout of the DAF YA 126 weapons carrier is conventional, with the engine at the front, the driver and one passenger in the centre, and the cargo area at the rear. The windscreen can be folded down onto the bonnet and the rear cargo area can be covered by removable bows and a tarpaulin cover. Four troops can be seated down each side of the cargo area and the dropdown tailgate facilitates the loading and unloading of supplies. The engine of the YA 126, which is the same as that installed in the **DAF YA 314** (6×6) 3000-kg (6,614-lb) truck, is coupled to a manual gearbox with four forward and one reverse gear and a two-speed transfer case. The front and rear wheels, which have 9.00×16 tyres, are suspended on two longitudinal trailing arms connected at the front with transversely mounted tubular beams containing torsion bars. Between the upper trailing arms and the chassis auxiliary rubber springs are fitted, and each wheel also has a hydraulic shock absorber.

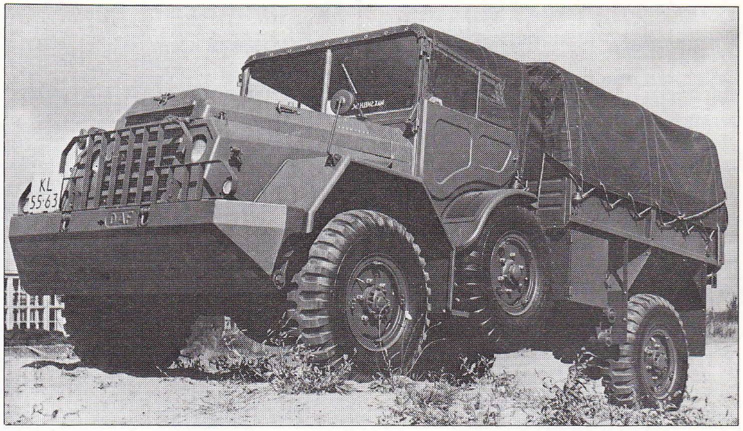
On each side of the vehicle is a spare wheel and tyre; these are free to rotate and so assist the vehicle in overcoming obstacles, a similar arrangement being used on the **DAF YA 328** (6×6) 3000-kg (6,614-lb) cargo truck. Some vehicles were fitted with a winch with a capacity of 2500 kg (5,512 lb), and variants included a workshop vehicle, fully enclosed van-type ambulance that can carry a maximum of four stretcher patients, and a command/radio vehicle.

To meet the requirements of the Dutch army for a light utility vehicle, the DAF company designed the **DAF 55 YA** (4×2) which is based on standard and proven commercial components. This was eventually standardized as the **DAF 66 YA**, and a total of 1,200 vehicles were delivered between 1973 and 1977. In addition to the driver, this vehicle can carry three passengers and 400 kg (881 lb) of cargo. To increase the load-carrying area the two rear seats can be folded down. Typical roles for the DAF 66 YA include rear-area military policing where good off-road performance is not required, casualty evacuation with two stretcher patients plus the medical attendant and driver, and radio carrying.

The Dutch army is also a large user of the Land Rover (4×4) vehicle, including a number supplied to meet its own specific requirements.

Specification

DAF YA 126
Crew: 1+1 (plus 8 in rear)
Weight: empty 4230 kg (9,325 lb) and loaded 3230 kg (7,121 lb)
Powerplant: one Hercules JXC 6-cylinder petrol engine developing 102 hp (76 kW)
Dimensions: length 4.55 m (14 ft 11 in); width 2.10 m (6 ft 11 in); height 2.20 m (7 ft 3 in)
Performance: maximum road speed 84 km/h (52 mph); maximum range 330 km (205 miles); gradient 65 per cent; fording 0.76 m (2 ft 6 in)



A DAF YA 126 (4×4) weapons carrier, which was in production for the Dutch army between 1952 and 1960. An unusual feature of this vehicle is that the spare wheel on each side is free-wheeling and assists the YA 126 in overcoming obstacles while crossing rough country.

JAPAN

Japanese light vehicles

In the early 1950s Mitsubishi Motors Corporation obtained a licence from the American Jeep manufacturer Willys to undertake production of the Jeep in Japan for both civilian and military roles. The **Mitsubishi J54A**, powered by a four-cylinder petrol engine developing 75 hp (56 kW), was the standard ¼-ton vehicle of the Japanese Self-Defence Forces for many years. This has now been replaced by the **J25A** which has the military designation **Type 73**; this is powered by a diesel for increased fuel efficiency. The Type 73 is very similar in appearance to the Jeeps used by the Allies during World War II, and has an identical layout with the engine at the front, driver and one passenger in the centre, and two seats at the rear. One of the distinguishing features of these vehicles is that each of the headlamps at the front has vertical bars to protect it from damage. As usual there are many variants of Jeep used by the Japanese Ground Self-Defence Force, including a reconnaissance vehicle fitted with a pintle-mounted 7.62-mm (0.3-in) machine-gun, and an anti-tank vehicle with the 106-mm (4.17-in) M40 recoilless rifle, KAM-3D (Type 64) or the more recent KAM-9 (Type 79) anti-tank missiles, the last having a much longer range.

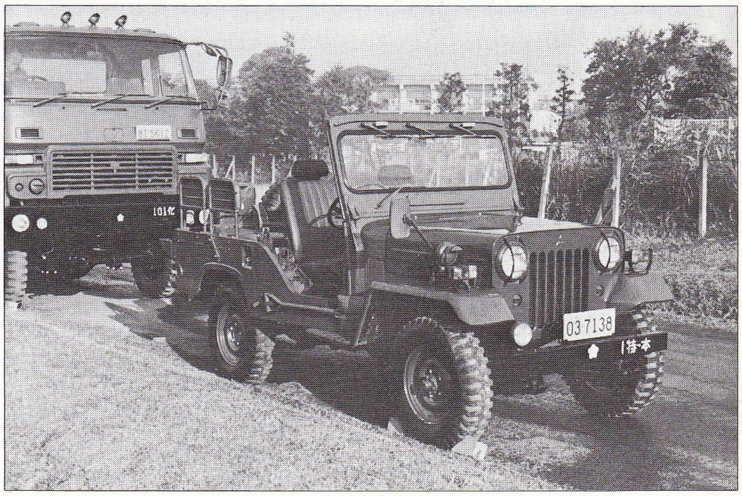
In addition to Mitsubishi, the Nissan Motor Company and Toyota also manufacture light vehicles. These are designed for civilian applications but are used by many armies around the world. The **Nissan Patrol** vehicle is produced in standard open-type as well as hard-top, pick-up and long-wheelbase configuration. It has also been built under licence in India by Mahindra and Mahindra, which has supplied many vehicles to the Indian armed forces for a wide range of roles including anti-tank (with recoilless rifles), command (with radios) and reconnaissance. One of the more unusual versions used by the Indian army has three SS.11 wire-guided anti-tank missiles over the roof, firing forward. India has also exported vehicles to other countries, and recently supplied some 4,000 Jeep kits for assembly in Iran.

The **Toyota Land Cruiser** is used by many countries in Africa and the Far East, and is available in three different wheelbases (standard, long wheelbase and super long wheelbase), the first two of these being used by the military. They are available with four- or six-cylinder petrol or diesel engines, the petrol engine being preferred in many parts of the third world as there are more petrol than diesel stations.

If one excludes the United States and the Soviet Union, the British Land Rover was for many years the most widely used vehicle of its type, but in recent years the Japanese have been making steady inroads to many traditional Land Rover markets, and in 1980 alone Nissan and Toyota between them built some 150,000 4×4 light vehicles for the home and export markets, although most of these were for civilian rather than military use.

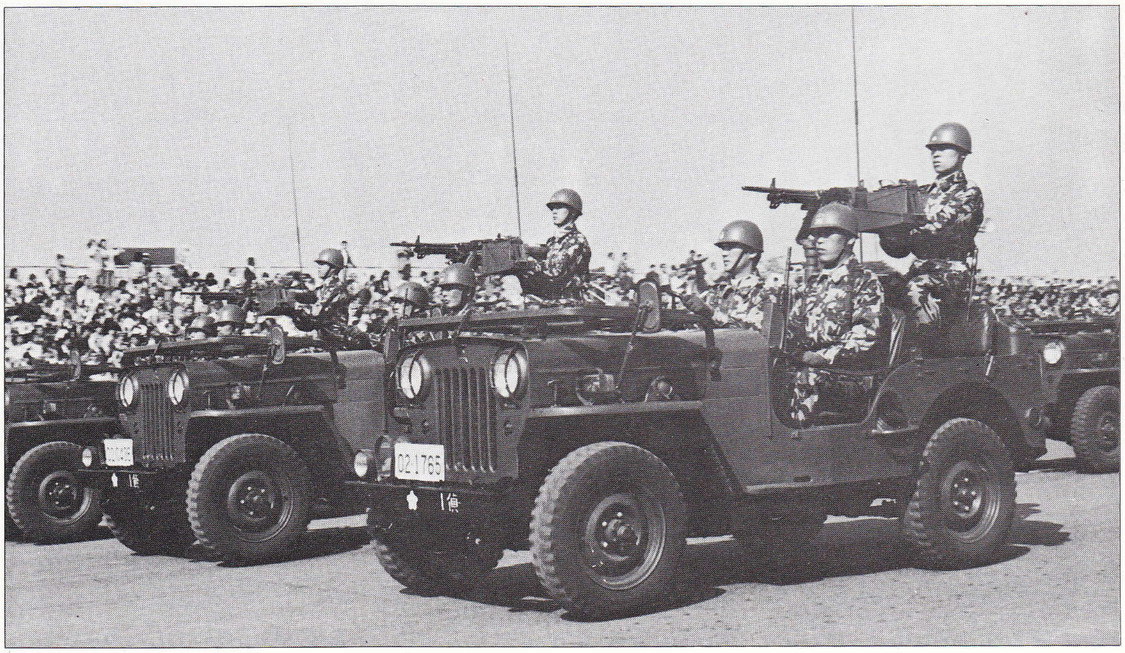
Specification

Mitsubishi J25A
Crew: 1+1 (plus 2 in rear)
Weight: empty 1420 kg (3,130 lb) and loaded 1900 kg (4,189 lb)
Powerplant: one 4-cylinder diesel developing 80 hp (59.7 kW)
Dimensions: length 3.75 m (12 ft 4 in); width 1.655 m (5 ft 5 in); height 1.95 m (6 ft 5 in);
Performance: maximum road speed 90 km/h (56 mph); maximum range 500 km (311 miles); gradient 60 per cent; fording 0.5 m (1 ft 8 in)



Above: A long-wheelbase Mitsubishi (4×4) light vehicle, which can carry six men instead of the four men of the normal version. These are used for a wide range of roles including that of anti-tank, fitted with ATGWs; command, fitted with radios; and forward ambulance.

Below: Mitsubishi (4×4) light vehicles of the Japanese Ground Self Defence Force (JGSDF) fitted with 7.62-mm (0.3-in) machine-guns on pintle mounts at the rear for use in the reconnaissance role. Latest versions of the vehicle have a diesel engine for longer range.



Armed Forces of the World

US Air Force

Part 3

Long viewed by some as the poor relation of SAC, Tactical Air Command (TAC) had the defence of North America added to its duties with the demise of the Aerospace Defense Command and has for the past few years been engaged in a major modernization programme which has witnessed the procurement of substantial numbers of a new generation of combat aircraft to replace older types such as the trusty McDonnell Douglas F-4 Phantom and the Vought A-7 Corsair II. Today, the Fairchild Republic A-10A Thunderbolt II, the McDonnell Douglas F-15 Eagle and the General Dynamics F-16 Fighting Falcon are predominant in TAC's combat echelons, but force modernization has not been solely confined to such elements, another noteworthy recent acquisition being the Boeing E-3A Sentry derivative of the Boeing 707 for airborne warning and control duty.

In terms of numbers of personnel assigned, SAC still maintains a position of superiority, but TAC is by far the largest USAF command with regard to the number of aircraft on hand. These are engaged in a multitude of missions encompassing virtually all areas of tactical air power, ranging from forward air control through air superiority to close air support and reconnaissance. Accordingly, TAC's fleet consists of several widely disparate types, of which most are optimized for a specific task, a situation far removed from that of the 1960s and early 1970s when the albeit highly versatile F-4 Phantom reigned almost supreme as a 'maid of all work'.

Making a substantial contribution to the Rapid Deployment Joint Task Force (RDJTF), TAC elements constitute the USAF component of two of the specified commands responsible to the Joint Chiefs of Staff, namely Atlantic Command and Readiness Command, and it is therefore possible for TAC aircraft to be ordered into action without referring to the more usual chain of command. TAC headquarters are located at Langley AFB, Virginia, routine administration being effected via two subordinate numbered air forces, these being the 9th Air Force at Shaw AFB, South Carolina, and the 12th Air Force at Bergstrom AFB, Texas. There are, in addition, several units which report directly to TAC headquarters, these mainly being concerned with the development and evaluation of weapons and tactics and with the administration of the various 'Flag' programmes of which 'Red Flag' is probably best known. This is the series of flying training exercises conducted regularly in the vicinity of Nellis AFB, Nevada, with the objective of providing realistic combat training so as to enhance aircrew experience levels and likelihood of survival in any future conflict. Other similar exercises include 'Black Flag' for maintenance personnel, 'Green Flag' predicted on European and Korean theatre operations and 'Blue Flag' which is concerned with battlefield management and the decision-making process.

The operational elements of the 9th Air Force are distributed between a total of 10 air bases, two of which (Langley and Eglin) host F-15 air superiority units, Langley's 1st Tactical Fighter Wing having recently completed transition to the newest variant of the Eagle, namely the F-15C with the so-called 'FAST Pack' (Fuel And Sensor Tactical Package); this unit is now one of those assigned to the RDJTF. TAC's second fairly new type, the A-10A Thunderbolt II with its fearsome General Electric GAU-8/A Avenger 30-mm Gatling-type cannon, equips two units: the 23rd TFW at England AFB, Louisiana, and the 354th TFW at Myrtle Beach AFB, South Carolina, whilst the F-16 Fighting Falcon also serves with two units, these being the 56th TFW at MacDill AFB, Florida, and the 363rd TFW at Shaw AFB, South Carolina. The latter wing's three F-16 squadrons are complemented by one squadron with the RF-4C Phantom, this being a legacy of the 363rd TFW's long career as a purely reconnaissance wing. Shaw is also home for the Cessna O-2As and Sikorsky CH-3E helicopters of the 507th TACW, additional elements of this unit being located at Patrick AFB, Florida, from where they operate O-2As and Rockwell OV-10A Broncos in the forward air control role. The three remaining wings which report to the 9th Air Force all operate Phantoms, two being fully operational units with the F-4E at Seymour-Johnson AFB, North Carolina (4th TFW), and at Moody AFB, Georgia (347th TFW), whilst the third serves in the training role with F-4Ds at Homestead AFB, Florida. This 31st TFW is earmarked for transition to the F-16 in the not-too-distant future as the requirement for Phantom crews diminishes with the type's continuing withdrawal from the front-line inventory.

TAC's second major component, the 12th Air Force, differs quite considerably in composition and equipment, three bases hosting two wings each as well as several with just a single wing. Long-range all-weather strike elements are concentrated within the 12th Air Force, these comprising the General Dynamics F-111As of the 366th TFW at Mountain-

The dorsal speed brake helps slow this McDonnell Douglas F-15 Eagle of the 49th TFW as it arrives at Holloman AFB on 20 December 1977 after the unit had converted at Luke AFB.

12 PASS

U.S. AIR FORCE

The Boeing E-3A Sentry, packaged into a 707-320C airframe, entered service in 1977 with the 552nd Airborne Warning and Control Wing at Tinker AFB, Oklahoma.

Home AFB, Idaho, and the F-111Ds of the 27th TFW at Cannon AFB, New Mexico. After a disaster-ridden early career, the F-111 eventually 'came good' in USAF service and such is the faith now placed in this type that it has formed the basis for the latest defence-suppression aircraft to enter the inventory. This, the Grumman/General Dynamics EF-111A 'Electric Fox', is essentially a much-modified F-111A, some 42 Grumman conversions at present being scheduled for service in the USA and Europe. Initial deliveries have been made to the 388th Electronic Countermeasures Squadron at Mountain-Home AFB, these operating alongside the standard F-111A as part of the 366th TFW. Another defence-suppression aircraft, the F-4G 'Wild Weasel' variant of the Phantom, equips the 37th TFW at George AFB, California, this base also being home for the 35th TFW which operates the F-4E on training, including the training of West German pilots in Phantoms owned by that country. Further Phantoms are to be found at Bergstrom AFB, Texas, although in this instance they are the reconnaissance-configured RF-4Cs of the 67th TRW, whilst the 12th Air Force also parents three F-16 units, namely the 58th TTW (formerly TFTW) at Luke AFB, Arizona; the 388th TFW at Hill AFB, Utah, and the 474th TFW at Nellis AFB, Nevada. The two remaining bases supporting 12th Air Force elements are Holloman AFB, New Mexico, which has the 49th TFW with F-15 Eagles plus the 479th TTW with a mixture of Northrop AT-38A and T-38B Talons, and Davis-Monthan AFB, Arizona, with the 355th TTW's A-10A Thunderbolt IIs plus the 602nd TACW with Cessna OA-37Bs for FAC functions. Of these four wings, the 479th TTW is perhaps the most unusual, this undertaking lead-in and operational conversion training of newly-qualified pilots before assignment to other TAC units, and to provide added realism the T-38Bs are fitted with underwing stores stations in order to carry air-to-ground rockets and/or gun pods.

The Fairchild Republic A-10A Thunderbolt II is employed by the USAF solely to destroy armoured vehicles, relying on manoeuvrability, heavy armour and systems redundancy to minimize losses.